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PUBLIC BROADCASTING COVERAGE IN THE UNITED STATES

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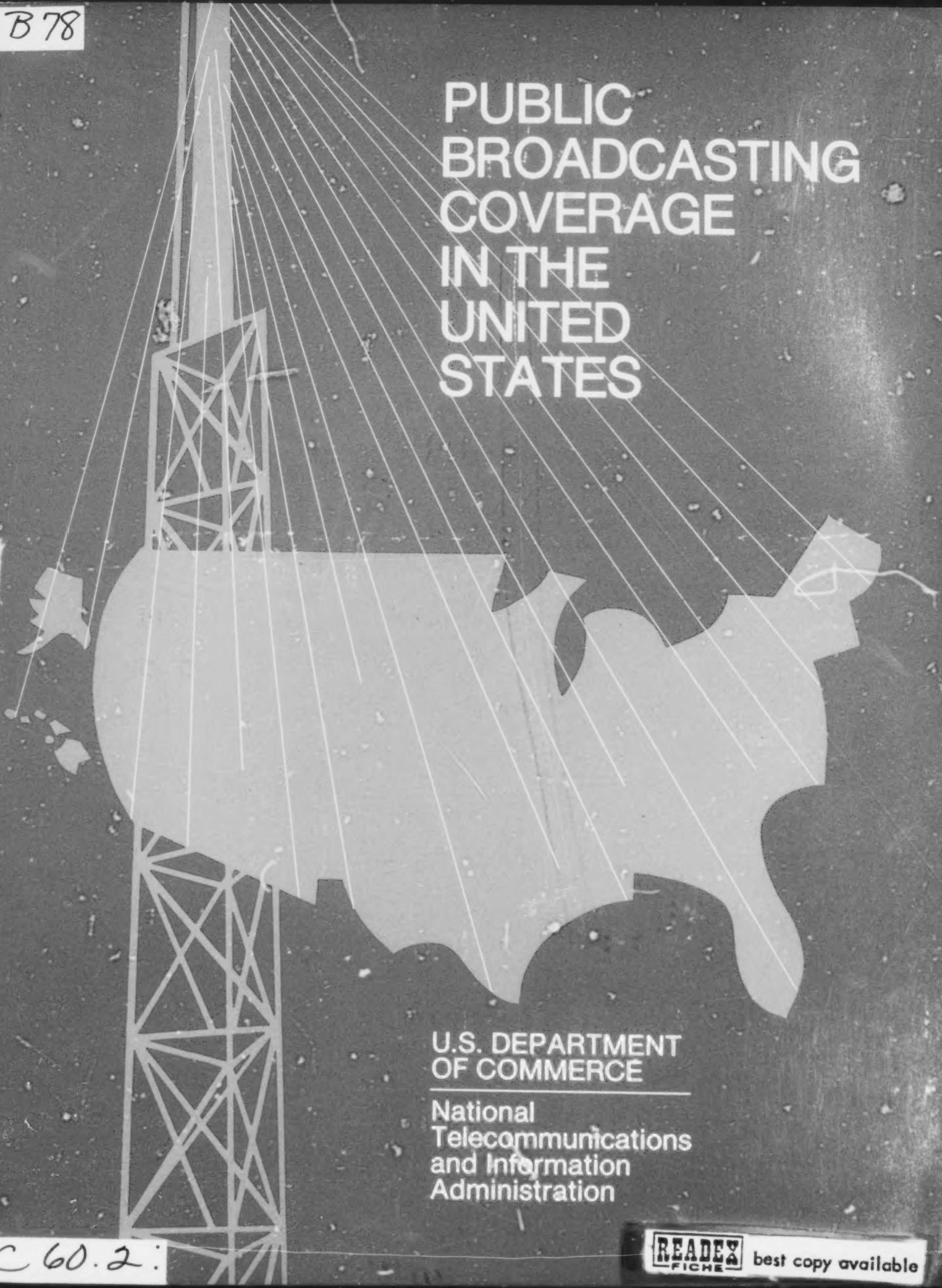

U.S. DEPARTMENT
OF COMMERCE

National
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Administration

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PUBLIC BROADCASTING COVERAGE IN THE UNITED STATES

NTIA
U.S. DEPARTMENT OF COMMERCE
NATIONAL TELECOMMUNICATIONS & INFORMATION ADMINISTRATION

U.S. DEPARTMENT OF COMMERCE
Robert A. Mosbacher, Secretary

Alfred C. Sikes, Assistant Secretary
for Communications and Information

July 1989

Foreword

Over the course of a year, the National Telecommunications and Information Administration (NTIA) examined the coverage penetration of public television and public radio within the United States. The Congress had directed NTIA to conduct the study so that information would be made available to public broadcasting policy decisionmakers and planners.

Concern over the exact extent of public television and public radio coverage has been a recurring theme in the public discussion of noncommercial broadcasting. NTIA is therefore pleased to place this report in the public domain. We do not claim that our study is definitive. The nature of radio and television signal propagation is such that a precise measurement would require an examination of each household's ability to receive a reliable signal. But we are confident that, in terms of accurate signal contour plotting, this report represents a significant advance towards definitiveness. The advance is directly attributable to the experience and expertise in broadcast signal analysis of NTIA's Institute for Telecommunication Sciences.

Besides calling upon its in-house technical expertise, NTIA also took advantage of the broad knowledge of public broadcasting professionals. Indeed, without the generous assistance provided by public broadcasting personnel across the country, our study would have lacked the accurate information needed to describe the local coverage situations. Station managers, station staff members (especially the engineers), state officials, and representatives of regional organizations all gave unselfishly of their time and knowledge. Their comments about the unserved areas -- why they are that way and what it might take to get signals there -- were exceptionally valuable. Moreover, the public television stations cooperated splendidlv in NTIA's effort to get a complete list of translators broadcasting public television signals. Such a translator list was not available from any other source.

In Washington, D.C., members of the national public broadcasting organizations were equally helpful. Over the many months of the study, officials of the Corporation for Public Broadcasting, the National Association of Public Television Stations, the Public Broadcasting Service, National Public Radio, and the National Federation of Community Broadcasters made themselves available to provide whatever information or guidance that NTIA might wish. Their advice was invaluable in refining our ideas as to the methodology that NTIA might employ in performing the research. As one might expect, thanks to their overall perspective, their insights into public broadcasting issues were particularly useful.

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Executive Summary

Background

In 1987, the Senate Appropriations Subcommittee on Commerce, Justice, and State, the Judiciary, and Related Agencies directed the National Telecommunications and Information Administration (NTIA) to study the extent of public radio and public television coverage in the United States. The study was to include an analysis of how rural areas might best be served.

Methodology

The greater part of the study consisted of analyzing state contour maps of over-the-air public television and public radio signals. (An "over-the-air" signal is one that may be received in the home without the assistance of cable television or a backyard satellite dish.) The analyses also involved formulating recommendations as to how unserved areas might be covered.

Signal Contour Maps

NTIA prepared public television contour maps and FM public radio contour maps for all states. Some states also have AM public radio maps. The maps reflect diverse data: Federal Communications Commission transmitter and antenna characteristics; topographical data from the Defense Mapping Agency and the U.S. Geological Survey; population statistics from the Bureau of the Census; and AM propagation data from the International Frequency Registration Board.

Stations included meet at least one of four criteria: Corporation for Public Broadcasting qualification; membership in National Public Radio; membership in the National Federation of Community Broadcasters; or receipt of a grant award from either the Public Telecommunications Facilities Program (PTFP) or one of its predecessor programs.

Depicted on the maps are full-service, "stand-alone" stations, major satellite repeaters and translators. A total of 334 public television stations, 476 FM public radio stations, and 34 AM public radio stations were included in the study.

State Analyses

Accompanying each state coverage map is a short essay exploring why certain areas of the country remain unserved and what it might take to reach them. NTIA interviewed officials from stations bordering the unserved areas as well as officials of national, regional and state public broadcasting organizations. Special attention was paid to the problems faced by rural areas.

Cable Television

Because of the scope and complexity of today's cable television operations, NTIA was obliged to confine its research to over-the-air public television signals. Some exploration of cable television carriage of public television services in unserved regions was done, however, during the telephone interviews with public broadcasting officials.

Major Findings

Public Television

- Approximately 94 percent of the U.S. population receives at least one over-the-air public television signal.
- Nearly 76,000,000 U.S. households of a national total of 80,389,000 households receive at least one over-the-air public television signal.
- Forty states and the District of Columbia have achieved public television population coverage percentages of 90 percent or above. Of these, six states and the District of Columbia boast complete coverage.
- Twenty-one states have public television coverage percentages below the national average of 94 percent. Sixteen of these states lie west of the Mississippi River.
- Only three states have coverage percentages less than 79 percent and the percentages of those three are in fact below 60 percent. The three are Montana (22%), Alaska (54%) and Wyoming (56%).
- A 1982 NTIA public broadcasting coverage study identified 13 major markets lacking an over-the-air public television service. Of these, four now have an over-the-air service and the other nine have public television via cable systems.

Public Radio

- Approximately 86 percent of the U.S. population receives at least one public radio signal.
- Slightly over 66,000,000 U.S. households receive at least one public radio service.
- A wide range of public radio population coverage totals is observable among the states. California, Connecticut, the District of Columbia and Mississippi, for example, all have coverage percentages either at or above 95 percent. Wyoming's coverage percentage, on the other hand, is 47 percent.

- Thirteen states have public radio coverage percentages below 80 percent. Most of these states have relatively low population totals.

- The northern Rocky Mountain region -- Idaho, Montana and Wyoming -- has relatively low public radio coverage percentage totals, as does the cluster of Arkansas, Oklahoma and Texas.

- The 1982 NTIA public broadcasting coverage study identified 51 major markets without public radio; only 13 of these remain without such a service.

Common Themes for Public Radio and Public TV Coverage

- The profile of a typical state with a low coverage percentage would include the following characteristics: low population, spaciousness, and rugged terrain.

- Many states that have achieved full coverage contain a single entity that has assumed responsibility for providing statewide public broadcasting service.

- In many cases, extension of signals with a local origination capability to remote rural areas is possible thanks to two innovative services: a public television system that combines satellite delivery with low-power stations; and with public radio, the Rocky Mountain Alternative Station concept, which allows local origination in combination with the rebroadcast of a distant signal.

Conclusions

- Television: No further full-service, "stand-alone" stations need be constructed in order to achieve complete public television coverage. Adequate signal extension may be realized by the use of major repeaters and translators retransmitting the signals of already-existing stations.

- Radio: Some full-service public radio stations may be activated to cover unserved regions. The best possibilities for this are in major markets or communities with established organizations (e.g., academic institutions or Indian tribal governments) willing to act as licensees. Most unserved regions, however, will eventually receive public radio from repeater stations and translators.

- Almost all areas remaining unserved may be characterized as "rural." Although some unserved regions include moderately sized communities, most of the regions are sparsely populated.

- Some very remote communities may not receive public television or public radio in the near future.

- Most prominent among the factors that will impede local efforts to extend public broadcasting service to unserved areas are costs and revenue potential. We refer to costs both for activation of the facilities and for operation/maintenance over the long term.

- Virtually all types of public broadcasting facilities are costly -- the exception, perhaps, being FM radio translators. Full-service stations are of course the most expensive, both in the near- and long-term. Major satellite repeater stations, however, are also costly, especially if they involve microwave interconnection.

- From place to place, other factors may inhibit signal extension. Difficult terrain is a consideration present with both radio and television.

- Another factor is pertinent only to public radio: lack of available frequencies. This might be caused by an abundance of low-wattage stations, frequency conflicts at the international borders, or proximity to channel 6 television stations.

- Still another factor is relevant only to public television: The presence of a reliable public television signal already on a cable television system in the unserved area.

- Although cable television's role in the provision of public television services is difficult to establish, it is clear to NTIA that cable's role is significant in many regions not reached by an over-the-air signal.

- Home satellite receivers (often referred to as "backyard dish antennas") are an increasingly significant force in the extension of public television signals. A recent NTIA publication, *NTIA TELECOM 2000,* reported that as of the summer of 1988, approximately 2 million home satellite receivers were in operation, with 1.2 million of them in rural areas.

Introduction

Background

In the fall of 1987, Congressional concern over the extent of public broadcasting coverage inspired a directive to the NTIA from the Senate Appropriations Subcommittee on Commerce, Justice, and State, the Judiciary, and Related Agencies. The directive was stated in the Subcommittee's report dated September 21, 1987. Under the heading "Coverage of Public TV and Radio," were these instructions:

> *During the course of hearings on the fiscal year 1988 appropriation for NTIA, information on the extent to which public radio and television broadcast signals reach territory in the continental 48 States was determined to be not fully available. While a 1982 study by NTIA showed that 95 percent of the U.S. population has access to either a public television or public radio broadcast signal, there is insufficient data on the extent to which public radio and television are available to households, respectively. NTIA only provides information on the percentage of U.S. households that receive either radio or television, but does not provide information on the respective percentages.*
>
> *The Committee, therefore, directs NTIA to conduct a study on the extent to which public radio signals and public television signals are available, and to provide respective percentages for households and territory. Because the Committee believes it is important to provide these services to as many rural residents as possible, the study should include an analysis of how these areas might best be served.*

For a number of reasons, NTIA was interested in such a study. First, we have shared the Congress' and the public broadcasting community's interest in current information. Second, such a study would be a logical extension of the report that the agency issued in 1982. And, finally, the results of the study would be useful to the PTFP in determining project priorities for grant applications proposing to extend public broadcasting signals.

Over a number of years, many agencies and commissions have attempted to define public television and public radio coverage. In 1982, as the Subcommittee noted, NTIA itself addressed the coverage issue in *A Plan for Public Telecommunications Facilities*. In this report, the NTIA produced national coverage maps. These were based on 1970 census information and Federal Communications Commission (FCC) data. These data, however, assumed average terrain and did not recognize mountains, valleys or other terrain barriers to signals. The maps reflected state-of-the-art computer technology at the time.

The signal contour maps for the present study -- as was the case with the maps in the 1982 report -- were produced by NTIA's research arm, the Institute for Telecommunication Sciences (ITS). To plot this study's maps, ITS employed technical advances that have occurred since the 1982 report in order to develop new, more sophisticated computer programs. The new software incorporated information from four data bases essential to the construction of realistic signal contours: Federal Communications Commission transmitter and antenna characteristics; topographical data from the Defense Mapping Agency and the U.S. Geological Survey; population statistics from the Bureau of the Census; and AM propagation data from the International Frequency Registration Board.

By incorporating terrain data into the signal configuration representations, this report corrects a major weakness of past coverage studies. Thus, the coverage depictions here reflect actual coverage in a more accurate manner than has heretofore been possible.

In addition, this study presents radio and television maps of each individual state, as well as analyses of each state's uncovered areas. This also represents an advance over the 1982 study.

And, of course, the present report's population calculations are based on the 1980 census reports, while the calculations of the earlier study, as noted above, had to rely on the results of the 1970 census.

Report Organization

To understand this report, one must comprehend its methodology. The next chapter is therefore dedicated to this subject. Methodology, of course, was touched upon in the discussion immediately above, where we highlighted the differences between NTIA's 1982 coverage study and the present report. Our methodology section covers the criteria used to select stations for inclusion in the survey, discusses at relative length the preparation of the contour maps, and explains how the analyses accompanying the maps were prepared. In addition, Appendix A considers the data bases and their application in greater technical detail.

Following the methodology chapter will be found the chapters dedicated to the national and state signal contour maps and the accompanying state analyses. One chapter each is devoted to public television and public radio. Each chapter begins with an evaluation of the medium's coverage achievements and problems from a national perpective. These overall assessments extract common themes from the state analyses, consider factors that appear to be inhibiting signal extension to unserved areas, and, in a general way, suggest how unserved regions might be reached. With each state, the contour map (or maps, if the state receives both FM and AM public radio coverage) is preceded by an analysis. The latter provides the state's basic population and coverage statistics, lists the stations in the state, discusses the state's general coverage situation, and concludes by identifying and analyzing its unserved areas.

A "Conclusions" chapter ends the formal report.

Three appendices, however, are also included. As noted above, Appendix A continues the explanation of the study's scientific aspects. It considers the data bases called upon for the design of the automated mapping program's software and describes how these data bases were applicable to the study.

Appendix B estimates the costs involved in extending public television and public radio signals by major repeater stations or by translators. The estimates are general and based on hypothetical situations. Nonetheless, they give an idea of what funding it would take to reach certain types of unserved areas.

Appendix C consists in large part of a listing of the public television and FM public radio translators whose contours are displayed on the maps. The appendix begins with a brief discussion of the role that translators play in providing coverage.

Methodology

This study's methodology may be divided into three basic elements:

- determination of the criteria for selecting stations for contour plotting;
- design of the software and preparation of the station master lists for plotting the contour maps and extracting population coverage statistics;
- analysis of the unserved areas.

Criteria For Station Inclusion

Noncommercial broadcasting services are provided by many types of organizations and facilities for diverse audiences. It was therefore necessary to define carefully the focus of this report. Thus, NTIA sought to limit the study to stations that had demonstrated a substantial and identifiable level of commitment to broad coverage of community interests.

To identify the elements involved in "substantial and identifiable" levels of commitment to public radio/television coverage of community interests, NTIA established the following criteria for station inclusion:

- Meeting the qualifications of the Corporation for Public Broadcasting (CPB) -- which require that stations hold a noncommercial broadcasting license from the FCC; employ a minimum of five (radio) or 10 (television) full-time professional staff; have studio and production facilities for regular production and broadcast of locally originated programming; generate minimum nonfederal income ($150,000 for radio, $300,000 for television); maintain a broadcast schedule of a prescribed minimum number of hours; and broadcast programs that meet community needs of an educational, informational, and cultural nature, but do not promote a religious philosophy.

- Membership in National Public Radio (NPR) -- which requires the same prerequisites as CPB qualification.

- Membership in the National Federation of Community Broadcasters (NFCB) -- which requires having an advisory board and a demonstrated programming mission of community service.

- Having received a NTIA/PTFP Construction Grant -- which requires a minimum of matching funds worth 25 percent of the total project cost, plus a demonstration of operational viability.

To be included in the study, a station had to meet at least one of these criteria. Most public television stations met one or more of them. Many noncommercial radio stations, however, were not included. Low-wattage stations run primarily by students and for students, for example, were not placed on our master list for plotting, nor were religious stations. Also not included were the many instructional television networks operated under the nonbroadcast Instructional Television Fixed Service (ITFS) frequency regulations.

Occasionally, a sizable station that clearly provides an important service to the community, broadly defined, did not meet the criteria and was excluded. In these instances, the NTIA staff tried to include a discussion of the station's contribution to coverage in the analysis accompanying that state's contour map.

By the end of the study, a total of 334 full-power public television stations, 476 full-power FM public radio stations, and 34 AM public radio stations had been included. (For the purposes of this discussion, all stations the transmission power of which is above the translator level will be referred to as "full-power.")

The Contour Maps

The contour maps were designed and plotted by the NTIA's laboratory in Boulder, Colorado, the Institute for Telecommunication Sciences (ITS).

Data Bases

A variety of data bases were used in the ITS computer program that produced the maps and population statistics.

- Population calculations were based on 1980 census data.

- Transmitter and antenna characteristics, which are the basis of the signal contour plotting, were supplied by the FCC.

- Terrain profiles were constructed from topographical data from the Defense Mapping Agency and the U.S. Geological Survey.

  The addition of terrain data corrects a major weakness of previous coverage studies and permits this report's maps to depict actual coverage in a more accurate manner than was possible before.

- Ground conductivity values used in the AM broadcasting analysis were provided by the International Frequency Registration Board.

(A more complete discussion of these data bases and how they were applied to this study may be found in Appendix A.)

Signal Contours

Two signal strength contours are depicted on the study's maps for each station and translator plotted. We recognize that signals do not stop at the edge of the "official" contours and are often received at great distances beyond the specified contours. Past that signal strength, however, reliability decreases.

Public Television

The two television contours are called "Grade A" and "Grade B". The Grade A contour has a minimum signal strength that can vary from 68 to 74 dBu and can range from 33 to 50 miles in radius. The Grade B signal strength varies from 47 to 64 dBu and ranges from 60 to 80 miles in radius from the transmitting site. (These mileage figures represent FCC estimates. They assume average terrain and state only approximate coverage from a maximum-power facility.)

Public Radio (FM)

With FM radio, the two contours are labeled "Primary" and "Secondary". The Primary service contour signal strength must be a minimum of 70 dBu and can range from 7 to 42 miles in radius depending upon the power class of the facility. This level of signal strength is sometimes referred to as "City Grade." The Secondary service contour signal strength must be a minimum of 60 dBu and ranges from 15 to 58 miles in radius from the transmitting site, depending on the power class of the facility.

Public Radio (AM)

With AM radio, the two signal strength contours are labeled "Urban" and "Rural." The Urban level signal strength is 66 dBu, while the Rural grade strength is 54 dBu. Coverage by an AM signal, unlike FM, is not simply described by a line of site calculation and therefore a generalization of the radius of coverage is not meaningful.

Population Statistics

NTIA extracted state population and household coverage statistics for both contours depicted. For reasons that are explained in our discussion of AM public radio, below, only the FM radio coverage statistics were used for calculating the state and national radio totals.

Preparing the Station Master Lists

Master lists of stations whose contours were to be plotted were composed for public television, FM public radio, and AM public radio. FCC station lists were the foundation for these master lists.

Using the FCC records, a printout was made of all FM stations occupying frequencies reserved for noncommercial use. It was then necessary to refine this list so that only stations meeting the study's criteria remained on it. To accomplish this, the NTIA staff used many sources. Most notable were the *Broadcast Yearbook*, the *Public Broadcasting Directory* published by the Corporation for Public Broadcasting, the records of grants awarded by the PTFP and its predecessor programs, and the membership list of the National Federation of Community Broadcasters. If questions remained unanswered after consultation with these sources, the staff called the station for the necessary information.

With public television, the FCC engineering records were again called upon to compose a list of full-power stations designated as "noncommercial." A computer "sweep" based on keywords selected to identify licensees of noncommercial translators was employed to complement the full-power station list. The television master list was also refined by the NTIA staff, who called upon many of the resources already mentioned in the above discussion of public radio.

Because so few AM public radio stations exist, the AM master list was composed entirely by the NTIA staff, without reference to computerized records.

Translators presented a particularly thorny problem. FCC records do not distinguish between commercial and noncommercial television translators, for example, nor do the records make such distinctions in the commercial FM radio bands. Neither the television nor the FM radio records reveals which entries are religious stations.

It soon became evident that the translator entries included a number of facilities retransmitting services that were either obviously commercial in nature or whose nature could not be determined without much time-consuming effort.

NTIA decided that the master lists should not contain any stations or translators not clearly "public" in nature. It was recognized that, given the realities of resources and time, this would inevitably mean that some valid public signals might be dropped.

An extensive effort was made to perfect the listing of public television translators. In good part, this was because the number of public television full-service stations is relatively small, as compared to the number of public radio stations. Thus, it was thought that television was "doable." The NTIA staff therefore called all CPB-qualified stations, asking them to cooperate by providing lists of all translators known to be broadcasting their signals. The responses were checked against the study's television master list and that list was amended accordingly.

Resource and time constraints prohibited NTIA from approaching FM radio translators with the same thoroughness. Instead, the staff relied on computer searches of translators obviously operated by noncommercial entities, plus those translators whose construction was assisted by PTFP funding.

The FCC data base records had some incorrect data -- e.g., negative antenna heights -- and some data that were missing. In the case of full-power stations, NTIA attempted to fill the data gaps whenever feasible. But for translators, resources and time did not allow such a level of completeness. Some translators known to be broadcasting public signals are therefore not plotted on the maps; they may be found listed in Appendix C, with asterisks beside them.

AM Radio

AM public radio posed special problems. First, relatively few AM public stations exist; only 34 AM stations were plotted. Also, because of FCC regulations designed to protect the coverage of selected AM stations at night, most of the AM public stations -- excluding those in Alaska -- have to decrease their power at night, in some cases rather dramatically. In addition, some AM stations are required to use directional antennas for their nighttime signal patterns. Moreover, man-made noise detracts from the reliability of AM radio reception, especially in urban areas.

Our calculations show that, at least during the daytime hours, nearly 24,000,000 people receive at least one AM public radio signal at the strong Urban-grade level of quality. Over 71,000,000 people receive an AM public service at the less-reliable Rural-grade strength; again, this would be during the daytime.

Nonetheless, it is apparent that relatively few people receive an AM public radio signal who do not receive at least one FM public radio signal.

In light of all this, AM station coverage has been plotted on separate state maps. Only the daytime coverage contours have been used as the source of the population and household statistics on the side of each map. AM coverage statistics, moreover, have not been counted in the calculations of state and national coverage statistics.

Alaska is the exception to much of the above. There, AM public radio stations play a singularly important role, because, in the communities they serve, they provide the only public signal. In the text accompanying the Alaska public radio maps, therefore, we provide state population coverage estimates including the people served by AM public radio.

Some Final Points About Mapping

Only full-power stations -- this, recall, includes major satellite repeater stations -- have their call letters printed on the contour maps. Initial versions of the maps also displayed translator call letters. In certain congested areas of the country, however, this resulted in an unreadable jumble. NTIA therefore decided to represent translators only by the circles indicating the transmitter locations. (Appendix C has a complete listing of the translators included in the study.)

Other mapping limitations will be noticeable. It proved to be impossible, for example, to show major cities on the maps. Tests with overlays to achieve this end demonstrated that this approach too was impracticable. Also, while most call letter overstrikes were corrected, some could not be.

Analysis of Unserved Areas

Once the initial drafts of the signal contour maps were plotted, it became possible to identify the unserved areas of each state and to begin exploring why they had remained unserved and what broadcast technologies might best be used to cover them.

To perform this part of the study, NTIA called upon the knowledge and experience of the public broadcasting community across the country. For the most part, NTIA had to rely on telephone conversations with key public broadcasters.

If a state had a single agency responsible for public television or public radio or both, then NTIA would put its questions to a top official of that agency. If, on the other hand, no such single agency were present, then the NTIA staff would call the stations bordering the state's unserved regions. Representatives from some regional public broadcasting organizations were also contacted.

In these conversations, topographical peculiarities were discovered or confirmed. Information concerning population density levels was sought, as were insights into the major factors continuing to inhibit coverage extension. Ideas were solicited as to how the unserved regions might best be reached and whether any construction plans to serve the regions were in the offing.

We also estimated the number of residents of the major unserved regions. To do this, we used county population statistics taken from 1980 census publications. We concede that the estimates are not precise, representing as they do a "best effort" to determine the population of these irregularly defined regions.

By necessity, our focus was on technologies and was quite general. We made little attempt to explore precise system configurations to reach the unserved areas. Nor did we attempt to take into account such administrative and legal factors as possible zoning problems or availability of tower sites. And, finally, we did not pursue whether the residents of any unserved community might actually have any wish for the public broadcasting service they lack and whether they had the will -- or the money -- to support a facility were it to be constructed.

The greater part of the effort took place from March to early December 1988. Only some very minor corrections were made after that time. This study, then, should be considered as a "snapshot in time" of public broadcasting as of the end of 1988.

Cable Television

Clearly, cable television plays an important role in providing public television service to the U.S. population. This is especially so in those areas where no over-the-air public television signal may be received. It is also apparent to us that almost all cable systems offer some form of public television service. However, the proliferation of cable television systems in recent years, combined with the demise of the FCC's "must-carry" regulations, have made it next to impossible to get an exact "fix" on cable's place in the provision of public television. NTIA lacked the staff, resources, and time to conduct anything resembling a full exploration of the subject. We thus had to rely on questions put to public broadcasters whose stations border the unserved areas in which we were interested.

Chapter I

Public Television Coverage

Analysis Of Public Television Coverage

Summary Of National Coverage

According to this study, as of the end of 1988 approximately 94 percent of the residents of the United States could receive an over-the-air public television signal. This coverage percentage translates to 213,223,000 persons receiving such a signal.

The study also shows that 75,608,000 households nationwide -- out of a national total of 80,389,000 households -- receive at least one over-the-air public television signal. Of the households served by over-the-air public television, approximately 54,417,000 -- or 72 percent -- receive two or more such signals.

(For a display of state and regional coverage statistics, see Tables 1-3 at the end of this analysis. A national public television coverage map will also be found after the tables.)

This finding is generally consistent with that of NTIA's 1982 study, *A Plan for Public Telecommunications Facilities,* which concluded that 92 percent of the U.S. population could then receive an over-the-air public television signal from licensed public television entities. It estimated that the anticipated coverage of stations under construction would increase the coverage to 93 percent. And, when stations with construction applications then pending before the Federal Communications Commission were considered, the study calculated the future coverage level to be approximately 94 percent.

Few general explanatory themes about coverage and lack of coverage emerge from the study, the main reason being that so few of the population are unserved. Six states, plus the District of Columbia, have complete coverage. Fully 34 states can boast population coverage ranging from 90-99 percent. Seven states have coverage from 79-89 percent and only three states have coverage under 79 percent.

Some common factors arise from a review of the situations of these three latter states: Montana, Alaska and Wyoming. All are very big states, of course, with much "open space." All three have rugged and mountainous terrain. And the three have relatively low population levels; all three have under 1,000,000 residents and two of the three have under 500,000.

Looking at the national coverage pattern, a slight eastern tilt towards high-coverage percentages is evident. Of the 21 states whose population coverage falls below the 94 percent national average, 16 are west of the Mississippi River. Of those 21 states, five have coverage percentages below 80 percent and of these, four lie west of the Mississippi. On the other hand, the District of Columbia and five of the six states that have 100 percent coverage lie east of the Mississippi -- and the sixth state is Louisiana, which of course borders the river. This tilt probably reflects the higher levels of population density in the eastern section of the country, which makes it relatively easy to achieve very high coverage percentages.

Another interesting point has to do with unified service within a state. Of the six states that have full coverage, four have organizations that have assumed responsibility for achieving coverage in all or a substantial part of the state in question.

The Role Of Cable Television

The present study focused on coverage of over-the-air public television. Nonetheless, NTIA's research into unserved areas shows clearly that cable television is a valuable complement to over-the-air broadcasting as a provider of public television.

One reason is cable television's reach, which is now truly impressive. The October 1988 report, *NTIA TELECOM 2000,* found that in 1988, approximately 8,500 cable television systems were operating in the United States. Moreover, approximately 80 percent of the nation's households had access to cable television, with more than half of them subscribers.

The dramatic increase in the number of cable systems over the past twenty years has allowed the extension of public television signals into areas that do not receive -- and perhaps never will receive -- acceptable over-the-air signals.

Montana is a case in point. It has by far the lowest percentage of over-the-air coverage: approximately 22 percent. NTIA's research, however, indicates that Montana has far-reaching cable television services, most of which presumably offer a public television signal. Our research into this aspect of public television in Montana was admittedly cursory, but it was enough to give us confidence that at least half of the Montana population has access to a public television signal.

Major Unserved Markets

In its 1982 study of public telecommunications coverage, NTIA identified 13 major markets unserved by a broadcast public television station. Since that time, public television stations have been constructed in four of these communities: Amarillo, TX (KACV-TV), Riverton, WY (KCWC-TV), Odessa, TX (KOCV-TV), and Joplin, MO (KOZJ-TV).

Of the nine remaining markets still unserved by an over-the-air signal, all have cable television systems offering at least one public television service. The nine markets are: Yuma, AZ; Bakersfield, CA; Rockford, IL; Lafayette, IN; Great Falls, MT; Missoula/Butte, MT; Abilene, TX; San Angelo, TX; and Cheyenne, WY.

Reaching Unserved Areas

NTIA's analysis of the potential for public television signal extension into unserved areas clearly points toward one conclusion: it would appear that little or no need exists to construct new full-service, "stand-alone" public television stations in order to provide first public television coverage to the remaining unserved areas.

A corollary to this is that additional public television coverage to unserved areas could be most efficiently and economically provided by extending the signals of existing public television stations. Speaking in technical terms, this would be accomplished primarily through low-power stations, translators or -- if the financial support and population base is present -- satellite repeater stations.

Why are we not likely to see the activation of many new full-service stations? Costs lie at the heart of the problem. Establishing a station capable of being a Public Broadcasting System affiliate can cost anywhere from $750,000 to $2,000,000 in hardware expenses alone, and this assumes that no tower installation is required. Maintaining and operating the station will cost, at a minimum, $750,000 to $1,000,000 a year.

Depending on a number of variables, even a major satellite repeater station, if it involves a UHF transmitter and, say, three microwave links worth of equipment, could cost approximately $1,500,000. A television translator will most likely cost up to $40,000 and the total will be more if the translator must be connected to the host station via microwave. (Detailed estimates of representative construction costs of repeater stations and translators will be found in Appendix B.)

Justifying this kind of expense won't be easy for any local entity and will be especially difficult for organizations in rural communities. And, as we have seen, for the most part the remaining unserved regions are quite rural.

Primarily in recognition of this expense factor, reaching these rural areas might well be facilitated by the presence of a single local organization with the responsibility of reaching rural areas in the state.

We should note, however, that communications satellites, in combination with low-power television stations, now allow for cost-effective delivery of public television services to small, rural communities -- even ones in truly remote areas. Otherwise, these areas would most likely have to do without an over-the-air public television service. One entity providing such a service is Rural Television System, Inc. ("RTS").

In brief, the RTS configuration involves a low-power television station in the community. The latter transmits its PBS programming choices to the RTS automated switching center in Carson City, Nevada. RTS directs whatever programming has been ordered to the community in question from the communications satellite broadcasting the PBS signal. Equipping an RTS-affiliated station typically costs approximately $85,000/$95,000. A station requires one local technical person, usually a volunteer, as staff. It also requires an annual service charge, calculated on the basis of approximately $6 per household served, paid to the central organization.

A final point: The percentage of people in "unserved" rural areas who in fact have access to public television would increase if we were to consider the rural residents with home dish antennas. According to NTIA's recent publication, *NTIA TELECOM 2000,* as of July 1988, approximately two million satellite home receive antennas were operating nationwide; about 1.2 million of them were in rural areas. These home dish antennas are able to receive all Public Broadcasting Service national programming from communications satellites. A recent Federal law stipulated that the Public Broadcasting Service must transmit this programming by a "clear feed;" i.e., not "scrambled." In fact, to facilitate planning for the reception of its programming, the Public Broadcasting Service (PBS) offers a schedule of its "clear feed" programs to anyone who wants one. PBS is now sending out about 2,000 such program guides a month to interested home dish antenna owners. Naturally, no local programming would be available to someone receiving a public television signal in this manner.

Other Factors Hindering Extension

A few other factors might, from place to place and from time to time, impede efforts to extend over-the-air public television signals to currently unserved areas. For example, the required spacing between authorized channels might be a consideration. Also, agreements with Mexico and Canada about television channel allocations could delay -- and perhaps block -- the construction permit regulatory procedures.

And, in some locations, the pervasiveness of cable television coverage might act as a disincentive to aggressive over-the-air signal extension.

Public Television Coverage
Summary Tables
and National Map

Table 1

Public TV Coverage By State

Population in thousands

State	State Pop Total	Percent Covered
Alabama	3894	97
Alaska	402	54
Arizona	2718	93
Arkansas	2286	95
California	23668	92
Colorado	2890	94
Connecticut	3108	98
Delaware	594	100
District of Columbia	638	100
Florida	9746	99
Georgia	5463	99
Hawaii	965	97
Idaho	944	92
Illinois	11427	95
Indiana	5490	95
Iowa	2914	97
Kansas	2364	85
Kentucky	3661	96
Louisiana	4206	100
Maine	1125	95
Maryland	4217	99
Massachusetts	5737	96
Michigan	9262	100
Minnesota	4076	92
Mississippi	2521	100
Missouri	4917	79
Montana	787	22
Nebraska	1570	98
Nevada	800	89
New Hampshire	921	93
New Jersey	7365	97
New Mexico	1303	87
New York	17558	96
North Carolina	5882	98
North Dakota	653	90
Ohio	10798	99
Oklahoma	3025	96
Oregon	2633	93
Pennsylvania	11864	92
Rhode Island	947	100
South Carolina	3122	100
South Dakota	691	94
Tennessee	4591	93
Texas	14229	86
Utah	1461	92
Vermont	511	84
Virginia	5347	96
Washington	4132	90
West Virginia	1950	79
Wisconsin	4706	96
Wyoming	470	56
----	-----	-----
U.S. Totals:	226549	94

Table 2

Public TV Coverage By Percentage

Population in thousands

State	State Pop Total	Percent Covered
Montana	787	22
Alaska	402	54
Wyoming	470	56
Missouri	4917	79
West Virginia	1950	79
Vermont	511	84
Kansas	2364	85
Texas	14229	86
New Mexico	1303	87
Nevada	800	89
North Dakota	653	90
Washington	4132	90
California	23668	92
Idaho	944	92
Minnesota	4076	92
Pennsylvania	11864	92
Utah	1461	92
Arizona	2718	93
New Hampshire	921	93
Oregon	2633	93
Tennessee	4591	93
Colorado	2890	94
South Dakota	691	94
Arkansas	2286	95
Illinois	11427	95
Indiana	5490	95
Maine	1125	95
Kentucky	3661	96
Massachusetts	5737	96
New York	17558	96
Oklahoma	3025	96
Virginia	5347	96
Wisconsin	4706	96
Alabama	3894	97
Hawaii	965	97
Iowa	2914	97
New Jersey	7365	97
Connecticut	3108	98
Nebraska	1570	98
North Carolina	5882	98
Florida	9746	99
Georgia	5463	99
Maryland	4217	99
Ohio	10798	99
Delaware	594	100
District of Columbia	638	100
Louisiana	4206	100
Michigan	9262	100
Mississippi	2521	100
Rhode Island	947	100
South Carolina	3122	100
----	-----	-----
U.S. Totals:	226549	94

Table 3

PUBLIC TV COVERAGE BY REGION

Population in thousands

Region	State Pop Total	Percent Covered
North East		
Connecticut	3108	98
Massachusetts	5737	96
Maine	1125	95
New Hampshire	921	93
Rhode Island	947	100
Vermont	511	84
Total:	12349	97
Mid Atlantic		
New Jersey	7365	97
New York	17558	96
Pennsylvania	11864	92
Total:	36787	95
East North Central		
Illinois	11427	95
Indiana	5490	95
Michigan	9262	100
Ohio	10798	99
Wisconsin	4706	96
Total:	41683	98
West North Central		
Iowa	2914	97
Kansas	2364	85
Minnesota	4076	92
Missouri	4917	79
North Dakota	653	90
Nebraska	1570	98
South Dakota	691	94
Total:	17185	89
South Atlantic		
District of Columbia	638	100
Delaware	594	100
Florida	9746	99
Georgia	5463	99
Maryland	4217	99
North Carolina	5882	98
South Carolina	3122	100
Virginia	5347	96
West Virginia	1950	79
Total:	36959	98

Table 3 continued

PUBLIC TV COVERAGE BY REGION

Population in thousands

Region	State Pop Total	Percent Covered
East South Central		
Alabama	3894	97
Kentucky	3661	96
Mississippi	2521	100
Tennessee	4591	93
Total:	14667	96
West South Central		
Arkansas	2286	95
Louisiana	4206	100
Oklahoma	3025	96
Texas	14229	86
Total:	23746	91
Mountain		
Arizona	2718	93
Colorado	2890	94
Idaho	944	92
Montana	787	22
New Mexico	1303	87
Nevada	800	89
Utah	1461	92
Wyoming	470	56
Total:	11373	85
Pacific		
Alaska	402	54
California	23668	92
Hawaii	965	97
Oregon	2633	93
Washington	4132	90
Total:	31800	92
United States		
Total:	226549	94

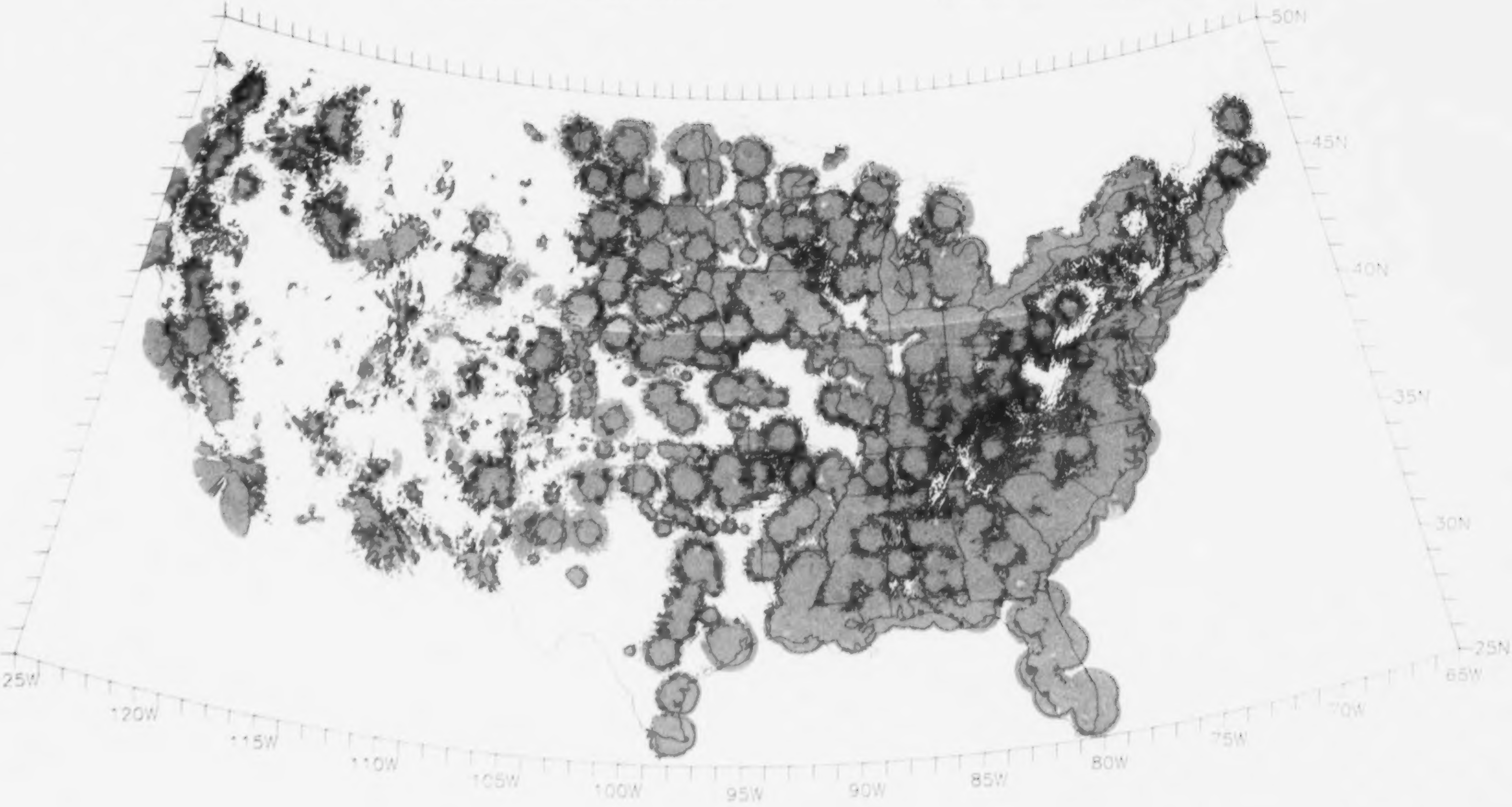
Public Television

United States

Signal Coverage

Grade A
Area: 1500500. sq mi
Population: 197223 Thousand
Households: 69926 Thousand

Grade B
Area: 2213900. sq mi
Population: 213223 Thousand
Households: 75608 Thousand


50N
45N
40N
35N
30N
25N
125W
120W
115W
110W
105W
100W
95W
90W
85W
80W
75W
70W
65W

State Analyses Of Public Television Coverage

ALABAMA

Basic Statistics

Total State Population:	3,894,000
Total Population Receiving Public TV Signal:	3,792,000 (97%)
Total Population in Uncovered Areas:	102,000

Public Television Stations in State

Community	Call Letters
Birmingham	WBIQ-TV
Demopolis	WIIQ-TV
Dozier	WDIQ-TV
Florence	WFIQ-TV
Huntsville	WHIQ-TV
Louisville	WGIQ-TV
Mobile	WEIQ-TV
Montgomery	WAIQ-TV
Mount Cheaha	WCIQ-TV

General Comments

The Alabama Educational Television Commission, a state-supported government entity, supplies public television to essentially all of the residents of Alabama. The Alabama public television network consists of nine public television stations supplemented by four television translators located in Guin, Hamilton, Jackson and Winfield. In addition, public television signals also are provided from adjacent state networks.

Uncovered Areas

Although the state is essentially covered by public television signals, two small uncovered areas are shown on the coverage maps. Since the population in these areas is comparatively sparse, public coverage might be best provided by the construction of additional public television translators.

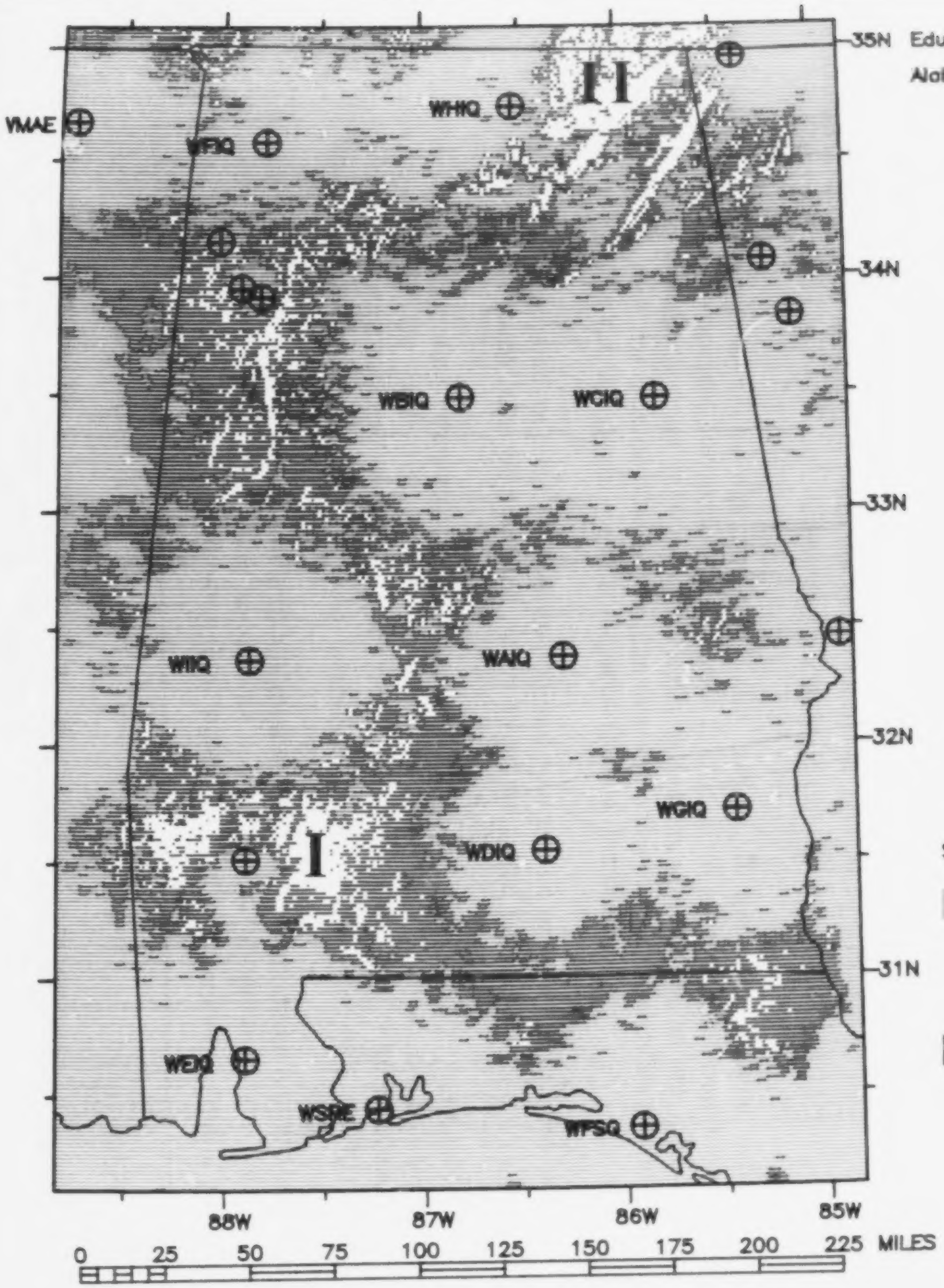
Region I

This is the area east of the Jackson translator.

Region II

Region II consists of the area northeast of Huntsville (WHIQ-TV).

Educational TV
Alabama



35N
34N
33N
32N
31N
88W
87W
86W
85W
0
25
50
75
100
125
150
175
200
225
MILES
WMAE
WFIQ
WHIQ
II
WBIQ
WCIQ
WIIQ
WAIQ
WGIQ
WDIQ
I
WEIQ
WSRE
WFSG

Signal Coverage

░ Grade A
Area: 39600. sq mi
Population: 3304000
Households: 1138000

▓ Grade B
Area: 50400. sq mi
Population: 3792000
Households: 1307000

ALASKA

Basic Statistics

Total State Population:	402,000
Total Population Receiving Public TV Signal:	219,000 (54%)
Total Population in Uncovered Areas:	183,000

Public Television Stations in State

Community	Call Letters
Anchorage	KAKM-TV
Bethel	KYUK-TV
Fairbanks	KUAC-TV
Juneau	KTOO-TV

General Comments

Alaska is of course by far the largest of the states. It has three sizable urban communities: Anchorage, Fairbanks and Juneau. It also has a sprinkling of communities that vary in population from 1,000 to about 8,000, and many of those are in the 1,000 to 3,000 range. But the bulk of Alaska's communities are villages the populations of which are numbered in the hundreds -- and sometimes the low hundreds.

Extreme sparseness of population and exceptional vastness of territory, then, are two problems that Alaska faces in extending public television signal coverage.

Other factors inhibiting extension are ruggedness of terrain and state financial difficulties. The severity of the latter has been such that recently there appeared to be a real possibility that state financial support for public broadcasting would have to be withdrawn. If this had happened, it would have been calamitous for the public television system.

All three major urban areas and many of the moderately sized communities are covered by over-the-air public television. This is achieved by the four autonomous stations listed above, plus the translators rebroadcasting their signals.

As noted, the stations are independent. Three are operated by community nonprofit groups and one -- KUAC-TV -- is owned by an academic institution, the University of Alaska/Fairbanks. For all the autonomy of the stations, however, state funding plays an enormous role in station support and in signal extension. This funding is coordinated by the Alaska Public Broadcasting Commission (APBC). The APBC also heads the state's continuing, comprehensive public broadcasting long-range planning process.

Over-the-air public television is complemented somewhat by the PBS programming transmitted to almost all Alaskan communities via satellite on the Rural Alaska Television Network (RATNET). The RATNET service goes to all Alaskan communities with population totals above 25. The exceptions are the three major cities and Sitka, all of which are served by local commercial television stations. RATNET is broadcast to the communities via translator and is also present on the cable systems in the communities that have such systems. It is administered by the Alaska State Government's Division of Telecommunications. RATNET's service represents an amalgam of commercial and public television programming, with an emphasis on the former. A perusal of one week's RATNET schedule showed only 13 hours of public broadcasting programming for the entire week. Over half consisted of children's programming and 2-1/2 hours were devoted to Alaskan weather reports. Only one hour of public television programming was transmitted during the weekend.

Uncovered Areas

In spite of the singular vastness of Alaska, we have divided it into only two unserved regions. The southeast "Panhandle" is one. All the rest of the state is the other.

One or two general points should be made before we begin our discussion of the individual regions. First, it appears that, because of the distance/low-population-density combination, most over-the-air public television extension will depend on delivery by communications satellite. This will be expensive and therefore it will most likely be many years before such delivery is possible -- if it ever is.

As to retransmission of signals to the local communities, that will depend entirely on translators and the cable television systems. This is emphasized by the APBC in its long-range planning. Both full-service, "stand-alone" stations and major satellite repeater stations are too costly to be feasible.

If a communications satellite delivery system is made available, then it may be possible to extend over-the-air signals with relative ease. This is because, for some years, the state of Alaska transmitted a television service called "LearnAlaska" to all communities with population levels above 25. LearnAlaska was broadcast to the individual communities via satellite, with the signal retransmitted over the air from a television translator. LearnAlaska was discontinued a few years ago, but the now-unused translators by and large remain in place. This provides Alaska with a television translator "infrastructure" that conceivably could be called upon if the state finds the funding for satellite delivery.

Region I

Region I consists of the whole of Alaska except for the extreme southeast corner. Region I encompasses three of Alaska's four public television stations. Over-the-air service is provided via translator to clusters of communities around Fairbanks, around Anchorage, and to the south of Anchorage as far as Seldovia/Homer. Because of the flat country surrounding Bethel, the signal of that community's station extends with fair reliability perhaps sixty miles.

Unalaska, a small, very remote community on one of the Fox Islands, beyond the tip of the Alaskan Peninsular, has a low power station that broadcasts programming from video tapes provided by public station KAKM-TV in Anchorage.

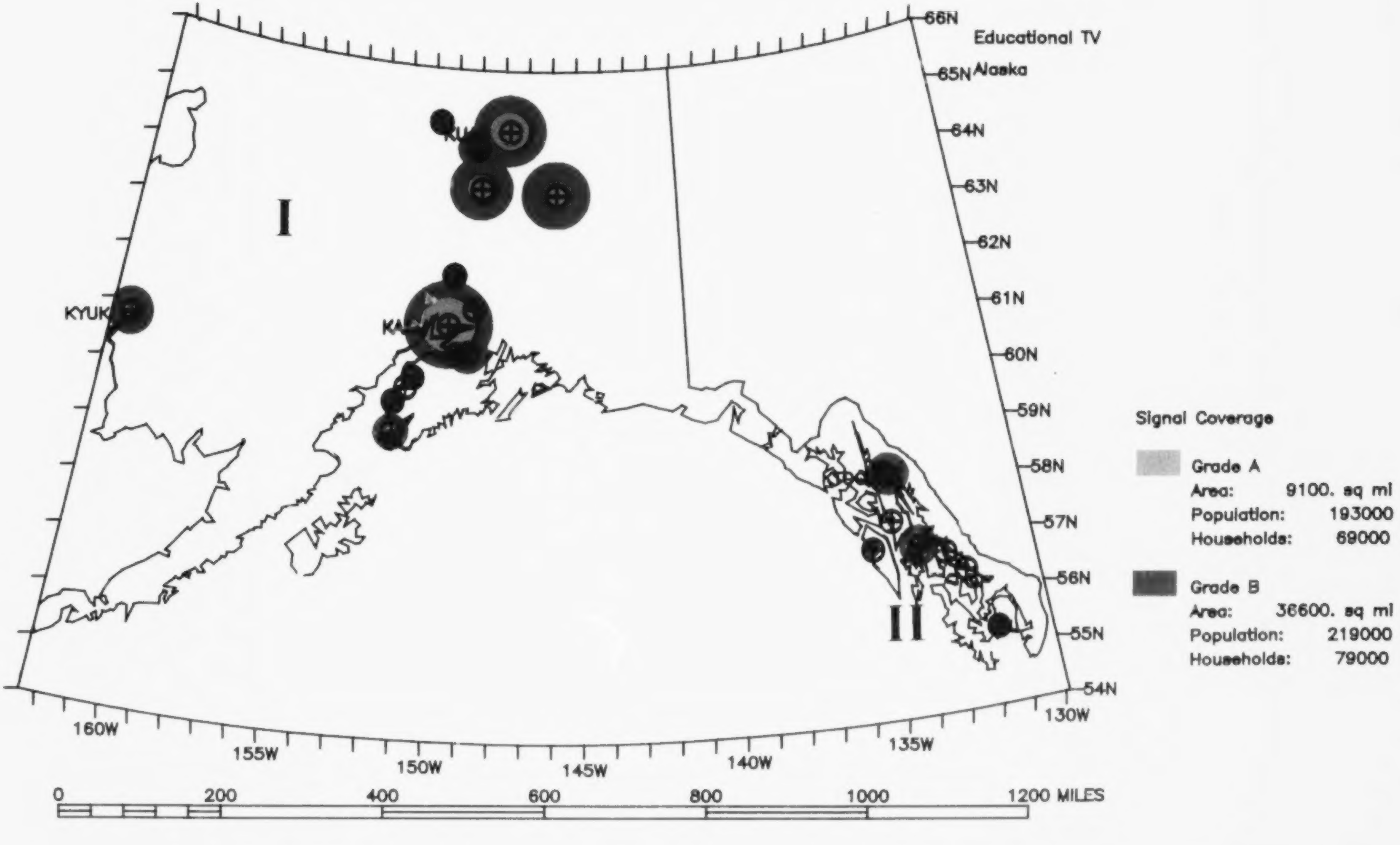
The remainder of this huge unserved region relies on RATNET for whatever public television programming it gets. Moreover, it appears that this is going to be the case for the immediate future. All the general comments made above about Alaska's unserved areas apply to Region I. Significant further extension of public television signals to most communities will probably depend upon communications satellite delivery.

Region II

Region II is the extreme southeast corner of Alaska, often referred to as the "Panhandle." This narrow stretch of territory is extremely rugged, being characterized by mountains, islands and fjords.

In spite of the difficult terrain, the Panhandle's public television coverage is rather extensive. Station KTOO-TV in Juneau is a full-service station and, as the accompanying map shows, its signal is carried to a number of communities to the south. This carriage is via leased common carrier microwave.

Moreover, state planning calls for some public television signal extension in the Panhandle over the next five years. First, KTOO-TV hopes to find a higher site for its tower. If this occurs, then KTOO-TV will provide a sufficiently strong signal to reach proposed translators in Skagway and Haines to the north, and Hoonah and Gustavus to the west. In addition, a second translator is under construction to serve the community of Kake and will greatly improve the reliability of the signal already there. And, finally, the APBC hopes to place a signal on the Metlakatla Indian Community's cable system sometime within the next year.


Educational TV
Alaska
Signal Coverage
Grade A
Area: 9100. sq mi
Population: 193000
Households: 69000
Grade B
Area: 36600. sq mi
Population: 219000
Households: 79000
I
II
KYUK
KU
KA
66N
65N
64N
63N
62N
61N
60N
59N
58N
57N
56N
55N
54N
160W
155W
150W
145W
140W
135W
130W
0
200
400
600
800
1000
1200 MILES

ARIZONA

Basic Statistics

Total State Population:	2,718,000
Total Population Receiving Public TV Signal:	2,519,000 (93%)
Total Population in Uncovered Areas:	199,000

Public Television Stations in State

Community	Call Letters
Phoenix	KAET-TV
Tucson	KUAT-TV KUAS-TV

General Comments

Arizona's four major population centers are Flagstaff, Phoenix, Tucson, and Yuma. Phoenix and Tucson are served by full-service public television stations. Flagstaff is served by a translator, while most of Yuma receives public television only from a cable service.

Uncovered Areas

The areas of Arizona not served by public television tend to be sparsely populated and translators would be the most realistic means of providing them a public signal.

Region I

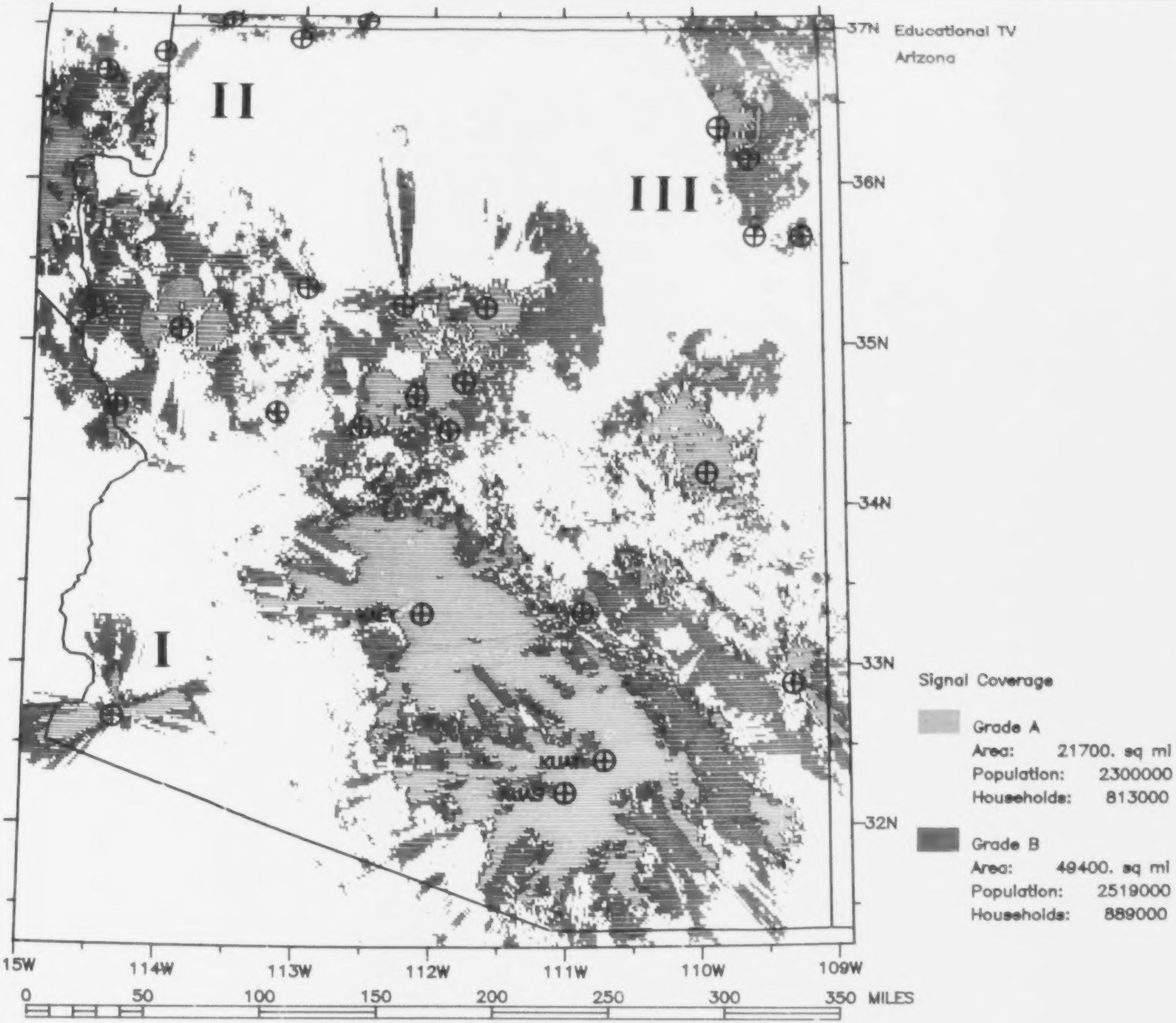
This heavily mountainous region contains numerous small towns. It is not served by a public television signal. However, this region does receive public television from a cable service with a large number of distant signals available. The communities in this area are so small that it is questionable whether the local financial base is sufficient for any of them to support a translator.

Region II

The sparsely populated northwest quadrant of Arizona is bordered by the Colorado River and includes the Grand Canyon National Park as well as numerous mountain ranges and the Kaibab National Forest. Because of the low population density within this area, it might not be economically feasible to bring public television service to it.

Region III

This region, located in the northeast quadrant of Arizona, is within the Navajo Indian Reservation. With the help of PTFP funds, the Navajo Nation is constructing a low-power television network that will provide the first public television service to communities across the entire main Navajo Reservation.



Educational TV

Arizona

37N
36N
35N
34N
33N
32N
115W
114W
113W
112W
111W
110W
109W
0
50
100
150
200
250
300
350 MILES
I
II
III
KUAT
KUAS
Signal Coverage
Grade A
Area: 21700. sq mi
Population: 2300000
Households: 813000
Grade B
Area: 49400. sq mi
Population: 2519000
Households: 889000

ARKANSAS

Basic Statistics

Total State Population:	2,286,000
Total Population Receiving Public TV Signal:	2,177,000 (95%)
Total Population in Uncovered Areas:	109,000

Public Television Stations in State

Community	Call Letters
Arkadelphia	KETG-TV
Fayetteville	KAFT-TV
Jonesboro	KTEJ-TV
Little Rock	KETS-TV
Mt. View	KEMV-TV

General Comments

In Arkansas, public television is provided by a state government entity, the Arkansas Educational Television Network Commission, with headquarters in Conway. Service is provided via KETS-TV in Little Rock, four repeater stations and a television translator station, in Eudora. Site selection for the stations in Fayetteville, Jonesboro and Arkadelphia was influenced by the existence of centers of learning in the state and economic considerations present at that time. Mountain View was selected to provide coverage to an uncovered area. In addition, public television signals from the adjoining states of Oklahoma, Missouri, Tennessee, Mississippi and Louisiana can be received in parts of the state.

Uncovered Areas

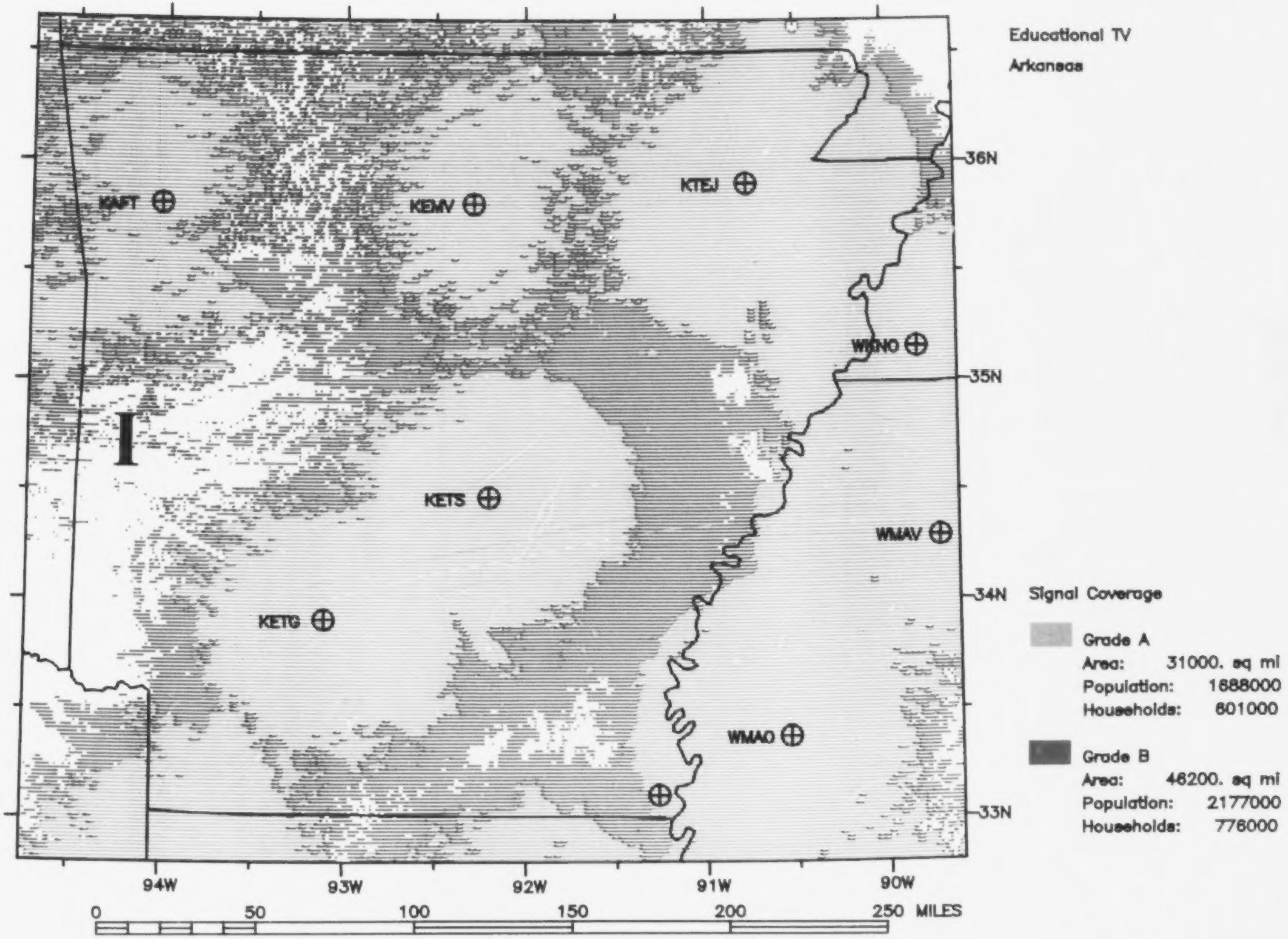
While the major population centers of the state appear to be adequately served, there are areas with low population density that do not appear to receive a reliable over-the-air signal. In many of these communities, local cable companies provide public television to system subscribers.

Region I

This region of west Arkansas appears to have sparse public television coverage. The area is the most mountainous and least populated area in the state. State public television officials indicate that any attempt to provide additional coverage would be costly and difficult. In sparsely populated areas, individual television translators appears to be the only realistic alternative.

Educational TV

Arkansas


KAFT
KEMV
KTEJ
WKNO
KETS
WMAV
KETG
WMAO
36N
35N
34N
33N
94W
93W
92W
91W
90W
0
50
100
150
200
250 MILES
Signal Coverage
Grade A
Area: 31000. sq mi
Population: 1688000
Households: 801000
Grade B
Area: 46200. sq mi
Population: 2177000
Households: 776000

CALIFORNIA

Basic Statistics

Total State Population:	23,668,000	
Total Population Receiving Public TV Signal:	21,889,000	(92%)
Total Population in Uncovered Areas:	1,779,000	

Public Television Stations in State

Community	Call Letters
Eureka	KEET-TV
Fresno	KMTF-TV
Huntington Beach	KOCE-TV
Los Angeles	KCET-TV
	KLCS-TV
Redding	KIXE-TV
Rohnert Park	KRCB-TV
Sacramento	KVIE-TV
San Bernardino	KVCR-TV
San Diego	KPBS-TV
San Francisco	KQED-TV
	KQEC-TV
San Jose	KTEH-TV
San Mateo	KCSM-TV

General Comments

California is served by 14 public television stations. Mountainous northern California is served by two VHF stations. KEET, Eureka, serves the coastal areas while KIXE, Redding, serves the Cascade Mountains and the northern Sacramento Valley. The lower Sacramento River valley and the Sierra Nevada Mountains are served by another VHF station, KVIE, Sacramento.

Five stations serve the San Francisco Bay area. KRCB in Rohnert Park serves the counties north of San Francisco Bay. KQED, channel 9, and KQEC, channel 32, are licensed to San Francisco, while KCSM operates in San Mateo, just to the south of San Francisco. KTEH, San Jose, serves the area to the south of the Bay.

Service to the central San Joaquin Valley is provided by KMTF, Fresno. The Los Angeles metropolitan area is served by four public television stations. KCET and KLCS operate in Los Angeles, while KOCE is located in Huntington Beach, south of Los Angeles. The city of San Bernardino and the eastern section of Los Angeles is served by KVCR. Southernmost California is served by KPBS, San Diego.

Uncovered Areas

Region I

The Coastal Mountains of northern California are very rugged. The unserved area is almost all national forest land (Klamath, Six Rivers, and Trinity National Forests) and the Marble Mountain Wilderness and Salmon-Trinity Alps Wilderness areas. KEET, Eureka, serves the coastal communities to Crescent City to the north. Service will be extended to Gasquet via cable when that system upgrades its equipment.

Region II

This area is a continuation of the Coastal Mountains and contains extensions of the Trinity and Six Rivers National Forest and the Yolla Bolly Middle Eel Wilderness area. KEET has encouraged local communities to construct translators to extend service. However, extension via VHF translator to Miranda was denied by the FCC. KQED, channel 9, from San Francisco, is available by translator in Ukiah, Booneville, Philo and Potter Valley in Mendocino County.

Region III

This area includes the rugged Cascade Mountains. Much of the unserved area is national forest land, including Klamath, Shasta and Lassen National Forests. KIXE, Redding, has several translators and has plans for translator service in Alturus, Lakehead, Susanville, Tulelake and Lewiston. Additionally, a low-power station is under construction in Cederville which will provide public television service.

Region IV

This area includes the rugged Sierra Nevada Mountains. Much of the unserved area consists of national forest lands, including Eldorado, Stanislaus, Sierra, Inyo and Sequoia National Forests and the Emigrant Basin Wilderness and Yosemite, King's Canyon and Sequoia National Parks.

Region V

This area consists of the Sierra Madre Mountains and is primarily the Los Padres National Forest. Public television from Los Angeles is available via cable to communities in Santa Barbara County and the southern portion of San Luis Obipso County. Perhaps 25 percent of the unserved California population resides in this region.

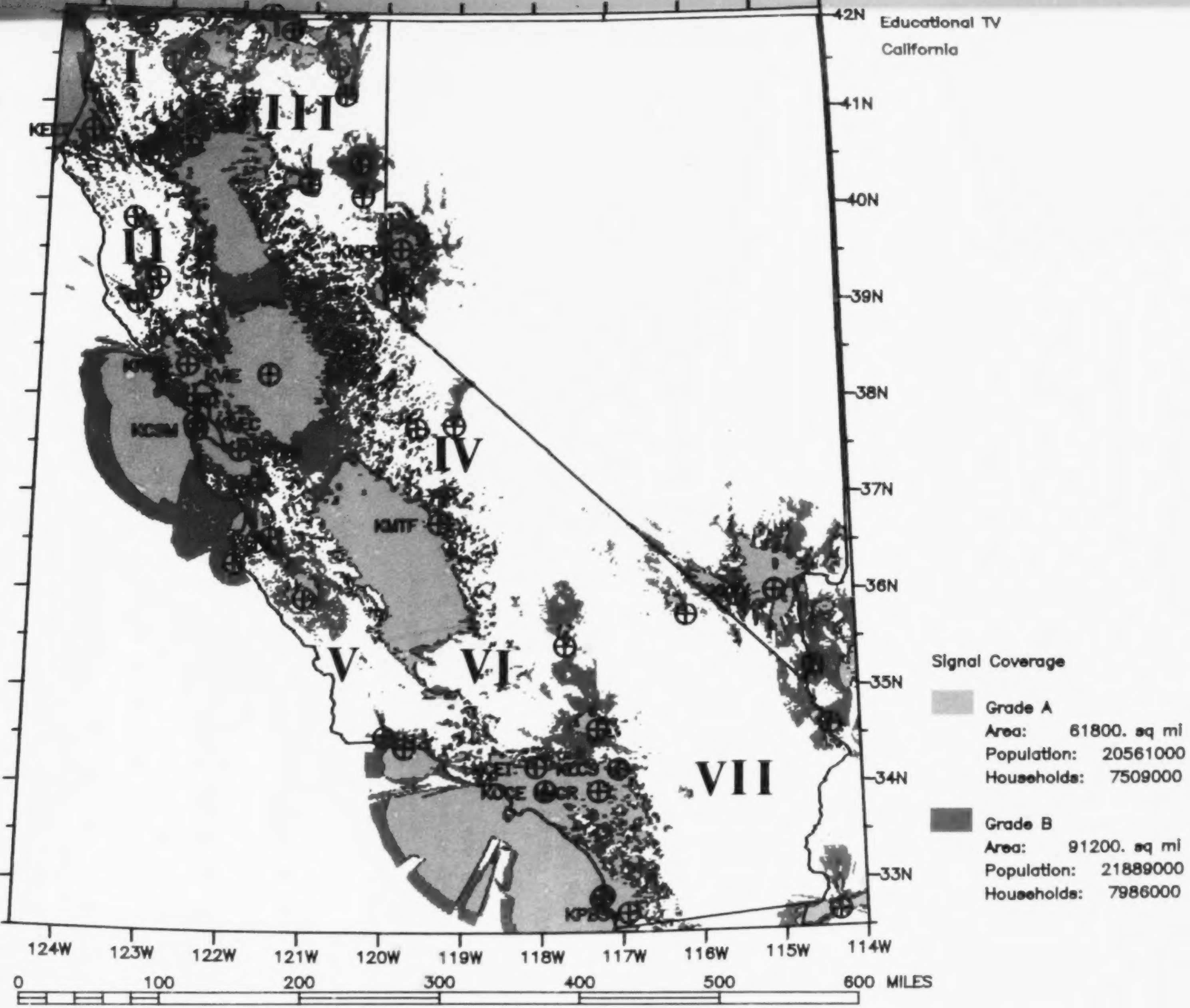
Region VI

Bakersfield is the largest area in the state of California without over-the-air reception of public television, though a signal is available on cable. KMTF in Fresno and KCET in Los Angeles both would like to construct a repeater station to serve the Bakersfield area and have submitted competing applications to the FCC and NTIA. This proposed facility would serve the southern part of the San Joaquin Valley to the Tehachapi Mountains. Approximately 25 percent of the state's unserved population live in this region.

Region VII

This area is primarily desert, the most notable area being Death Valley National Monument. Broadcast signals from the Los Angeles area are blocked by the San Gabriel and San Bernardino Mountains. The population in the remainder of this area is very low and widely dispersed. The scarcity of water limits the growth potential of this area. Public television from Los Angeles is available to many communities in the western portions of San Bernardino and Riverside counties via cable. Public television from San Diego is available to the Calexico area of Imperial County.

Educational TV
California



42N
41N
40N
39N
38N
37N
36N
35N
34N
33N
124W
123W
122W
121W
120W
119W
118W
117W
116W
115W
114W
0
100
200
300
400
500
600 MILES
I
II
III
IV
V
VI
VII
KNPB
KVIE
KCSM
KQEC
KMTF
KCET
KLCS
KOCE
KPBS
Signal Coverage
Grade A
Area: 61800. sq mi
Population: 20561000
Households: 7509000
Grade B
Area: 91200. sq mi
Population: 21889000
Households: 7986000

COLORADO

Basic Statistics

Total State Population:	2,890,000
Total Population Receiving Public TV Signal:	2,711,000 (94%)
Total of Population in Areas Areas:	179,000

Public Television Stations in State

Community	Call Letters
Denver	KRMA-TV KBDI-TV
Pueblo	KTSC-TV

General Comments

Because of the mountainous nature of a vast portion of the state, the population of Colorado has historically depended upon translators or microwave-fed cable delivery for television service. The primary population centers: Denver, Colorado Springs, Pueblo, Boulder, Fort Collins, and Greeley are located along the "Front Range" on the eastern slope of the Rocky Mountains.

The balance of the state is either flat (eastern section), with vast distances between small population centers, or mountainous, with sparsely populated areas between mountain ranges and national forests (western slope). Coverage to these areas is limited to translators or microwave-fed cable systems.

Although we have identified four major unserved regions to be discussed in relative detail, the map shows that the coverage patterns of Colorado are irregular. In general terms, then, the unserved population is probably spread rather evenly throughout the state's "white areas."

Region I

The Baca County region is the subject of a recent PTFP grant award to help construct four television translators that will bring a first over-the-air public television signal to the entire area. The new translators will transmit the signal of KTSC-TV, in Pueblo. The signals will reach into the adjoining states of Oklahoma and Kansas as well.

Region II

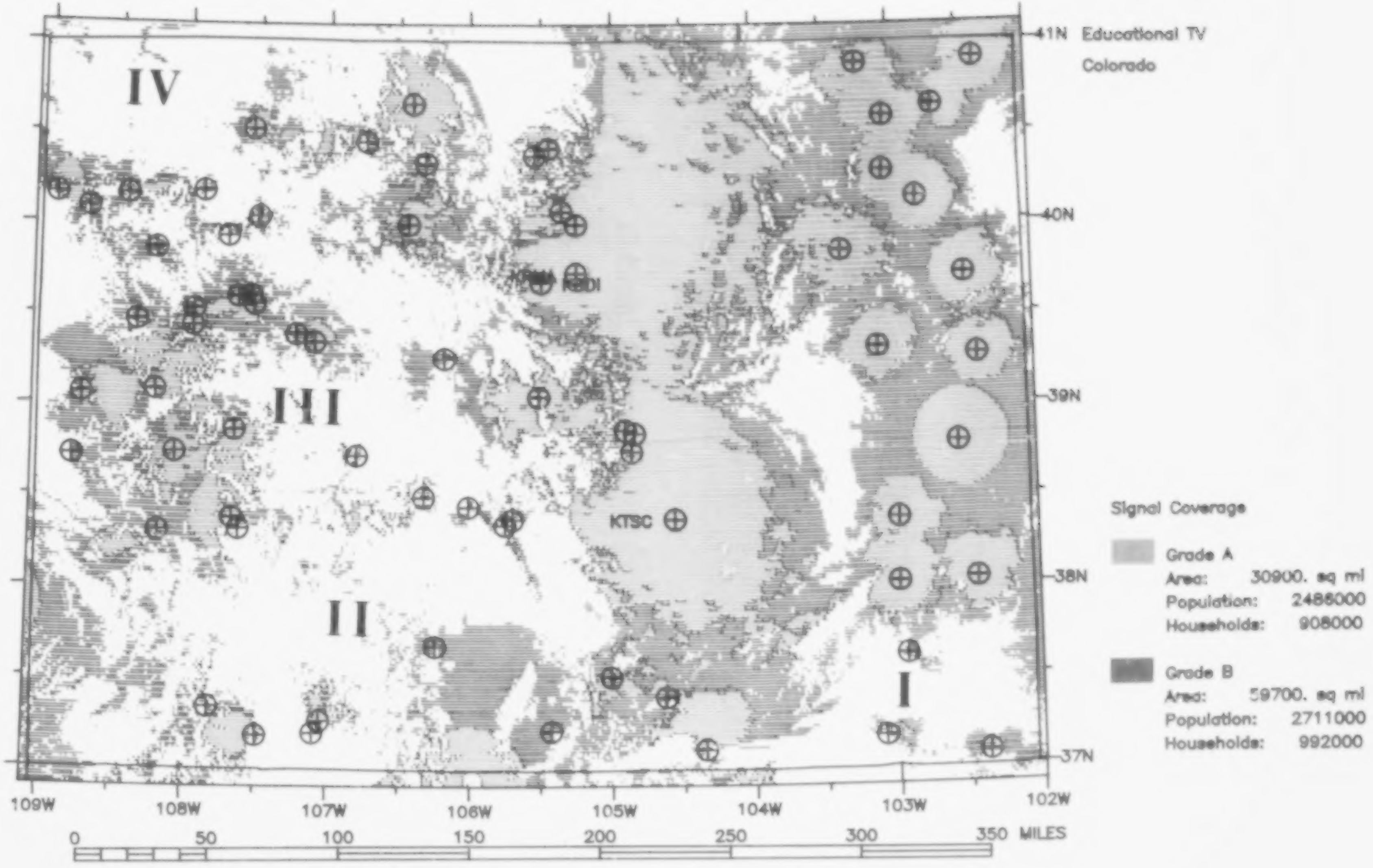
This region includes the San Juan and Rio Grand National Forests and the Continental Divide. Virtually every community which adjoins these areas has a community- or county-supported translator service available.

Region III

This region, the Gunisson National Forest, is composed of small communities with a limited population base. Any community in this area with a population of more than 1,000 is served through a microwave-fed translator from Denver.

Region IV

The Moffat County Region, located in the northwest corner of Colorado, has an approximate population of 13,000 people, most of whom live in the city of Craig (population: 8,100). Craig is presently served by both translator and cable from Denver. The balance of the area is characterized by numerous communities smaller than Dinosaur (population: 313).


Educational TV
Colorado
41N
40N
39N
38N
37N
109W
108W
107W
106W
105W
104W
103W
102W
0
50
100
150
200
250
300
350 MILES
IV
III
II
I
KRMA
KBDI
KTSC
Signal Coverage
Grade A
Area: 30900. sq mi
Population: 2486000
Households: 908000
Grade B
Area: 59700. sq mi
Population: 2711000
Households: 992000

CONNECTICUT

Basic Statistics

Total State Population:	3,108,000
Total Population Receiving Public TV Signal:	3,057,000 (98%)
Total Population in Uncovered Areas:	51,000

Public Television Stations in State

Community	Call Letters
Bridgeport	WEDW-TV
Hartford	WEDH-TV
New Haven	WEDY-TV
Norwich	WEDN-TV

General Comments

The Connecticut Educational Telecommunications Corporation (CETC), a community organization, provides public television throughout the state. CETC's flagship station and administrative headquarters are located in Hartford. It is the licensee of the three other television stations listed above. Although Connecticut is essentially covered by public television signals, there is a small area in the northwest where mountains create spotty coverage patterns.

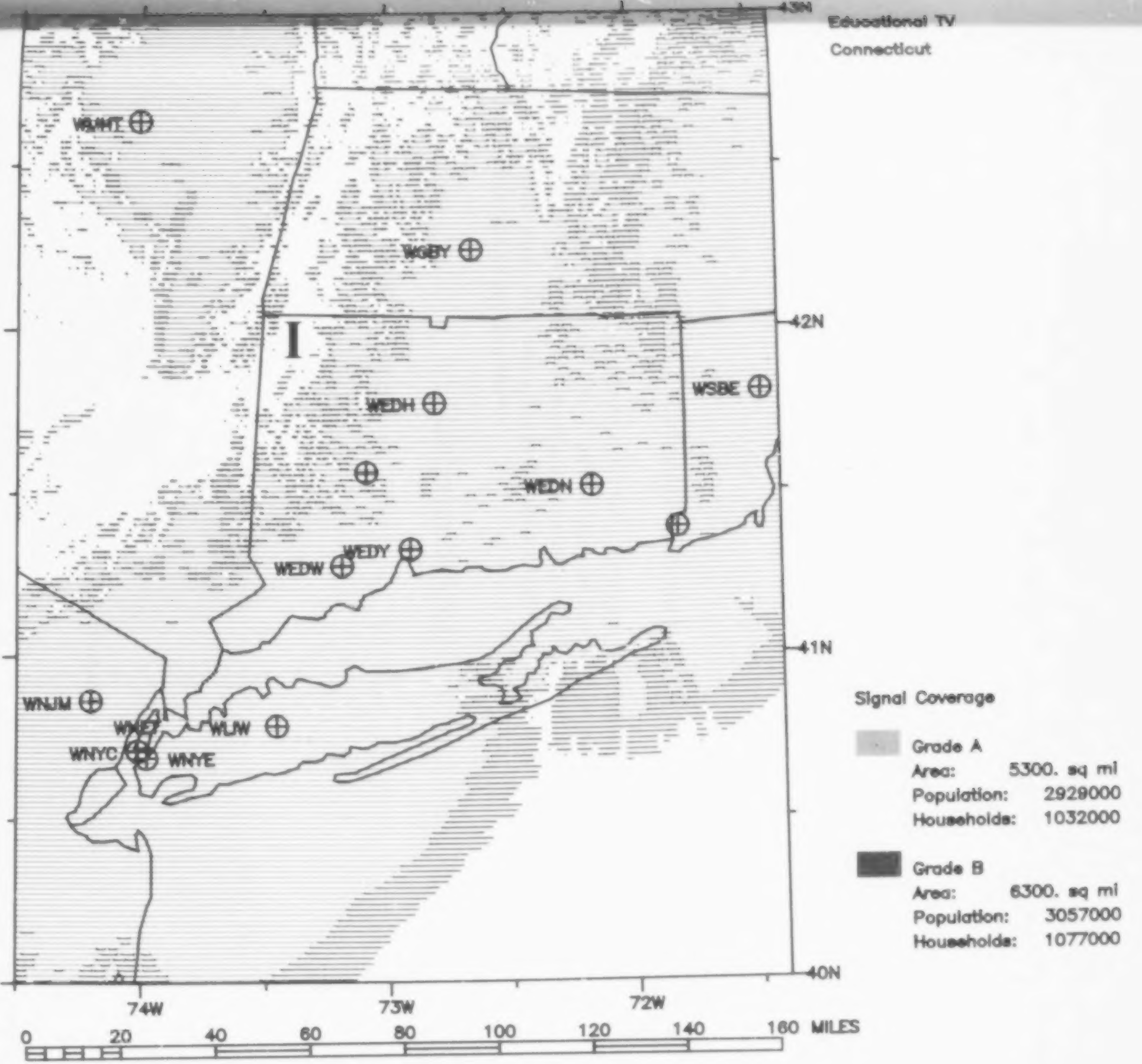
Uncovered Areas

Region I

This small, sparsely populated area of the state might be served by an anticipated power increase for WEDH in Hartford, by translators, or by a repeater station.

Educational TV

Connecticut


43N
42N
41N
40N
74W
73W
72W
WMHT
WGBY
I
WEDH
WSBE
WEDN
WEDY
WEDW
WNJM
WNET
WLIW
WNYC
WNYE
0
20
40
60
80
100
120
140
160 MILES
Signal Coverage
Grade A
Area: 5300. sq mi
Population: 2929000
Households: 1032000
Grade B
Area: 6300. sq mi
Population: 3057000
Households: 1077000

DELAWARE

Basic Statistics

Total State Population:	594,000
Total Population Receiving Public TV Signal:	594,000 (100%)
Total Population in Uncovered Areas:	0

Public Television Stations in State

Community	Call Letters
Wilmington	WHYY-TV
Seaford	WDPB-TV

General Comments

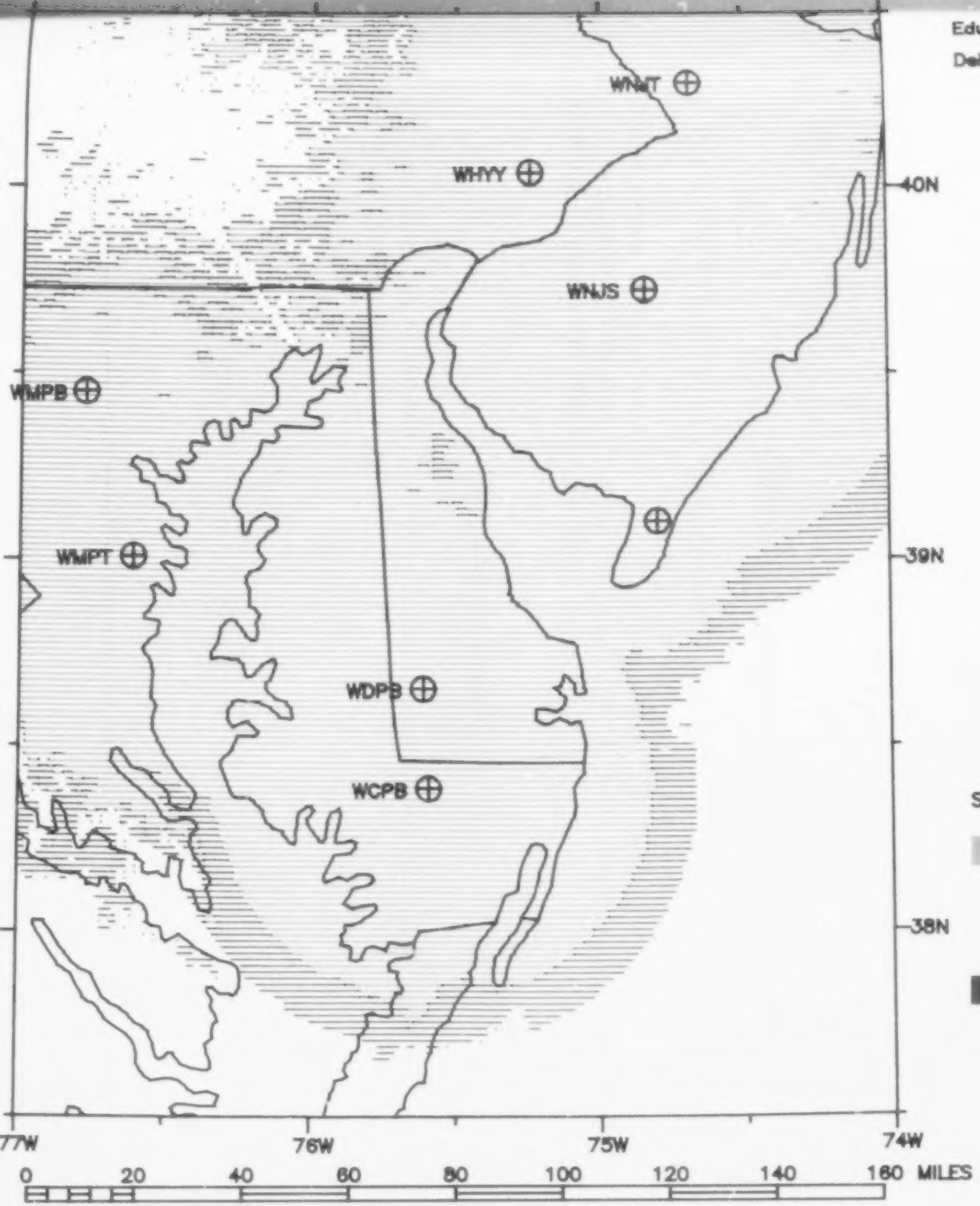
WHYY-TV is licensed to Wilmington, DE, although the station is actually located in Philadelphia, Pennsylvania. The southern part of the state is served by WHYY's small repeater station, WDPB-TV, located in Seaford. WDPB was a low-wattage, full-service station at one time, but was unable to sustain economic viability. WHYY maintains a major studio facility in Delaware.

Uncovered Areas

Delaware is essentially covered.

Educational TV

Delaware


WNJT
WHYY
WNJS
WMPB
WMPT
WDPB
WCPB
40N
39N
38N
77W
76W
75W
74W
0
20
40
60
80
100
120
140
160 MILES

Signal Coverage

▨ Grade A

Area:	2800. sq mi
Population:	581000
Households:	203000

■ Grade B

Area:	3300. sq mi
Population:	594000
Households:	207000

DISTRICT OF COLUMBIA

Basic Statistics

Total State Population:	638,000
Total Population Receiving Public TV Signal:	638,000 (100%)
Total Population in Uncovered Areas:	0

Public Television Stations in State

Community	Call Letters
Washington, DC	WETA-TV WHMM-TV

General Comments

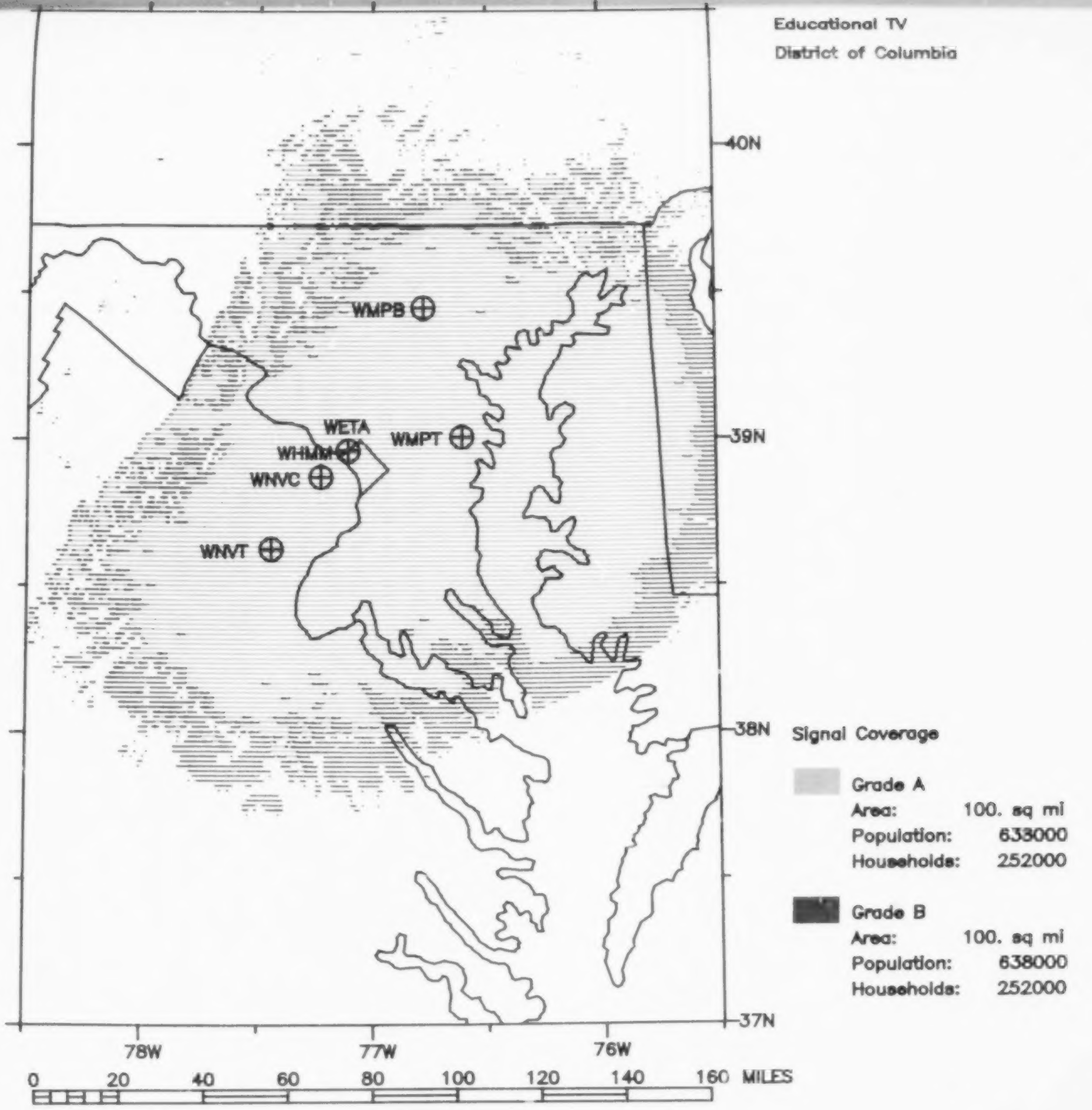
The District of Columbia is completely covered by over-the-air public television signals from local stations. In addition to the two stations licensed to the District, public television signals are also available from stations located in Maryland and Virginia. Public television is provided by both a university-based station, WHMM-TV, and a nonprofit educational organization which is the licensee of WETA-TV.

Uncovered Areas

There are no areas within the District of Columbia which do not receive at least one over-the-air public television signal.

Educational TV

District of Columbia



40N
39N
38N
37N
78W
77W
76W
WMPB
WETA
WHMM
WMPT
WNVC
WNVT
0
20
40
60
80
100
120
140
160 MILES
Signal Coverage
Grade A
Area: 100. sq mi
Population: 633000
Households: 252000
Grade B
Area: 100. sq mi
Population: 638000
Households: 252000

FLORIDA

Basic Statistics

Total State Population: 9,746,000

Total Population Receiving Public TV Signal: 9,569,000 (99%)

Total Population in Uncovered Areas: 77,000

Public Television Stations in State

Community	Call Letters
Ft. Myers	WSFP-TV
Gainesville	WUFT-TV
Jacksonville	WJCT-TV
Miami	WLRN-TV WPBT-TV
New Smyrna Beach	WCEU-TV
Orlando	WMFE-TV
Panama City	WFSG-TV
Pensacola	WSRE-TV
Tallahassee	WFSU-TV
Tampa	WEDU-TV WUSF-TV
West Palm Beach	WXEL-TV

General Comments

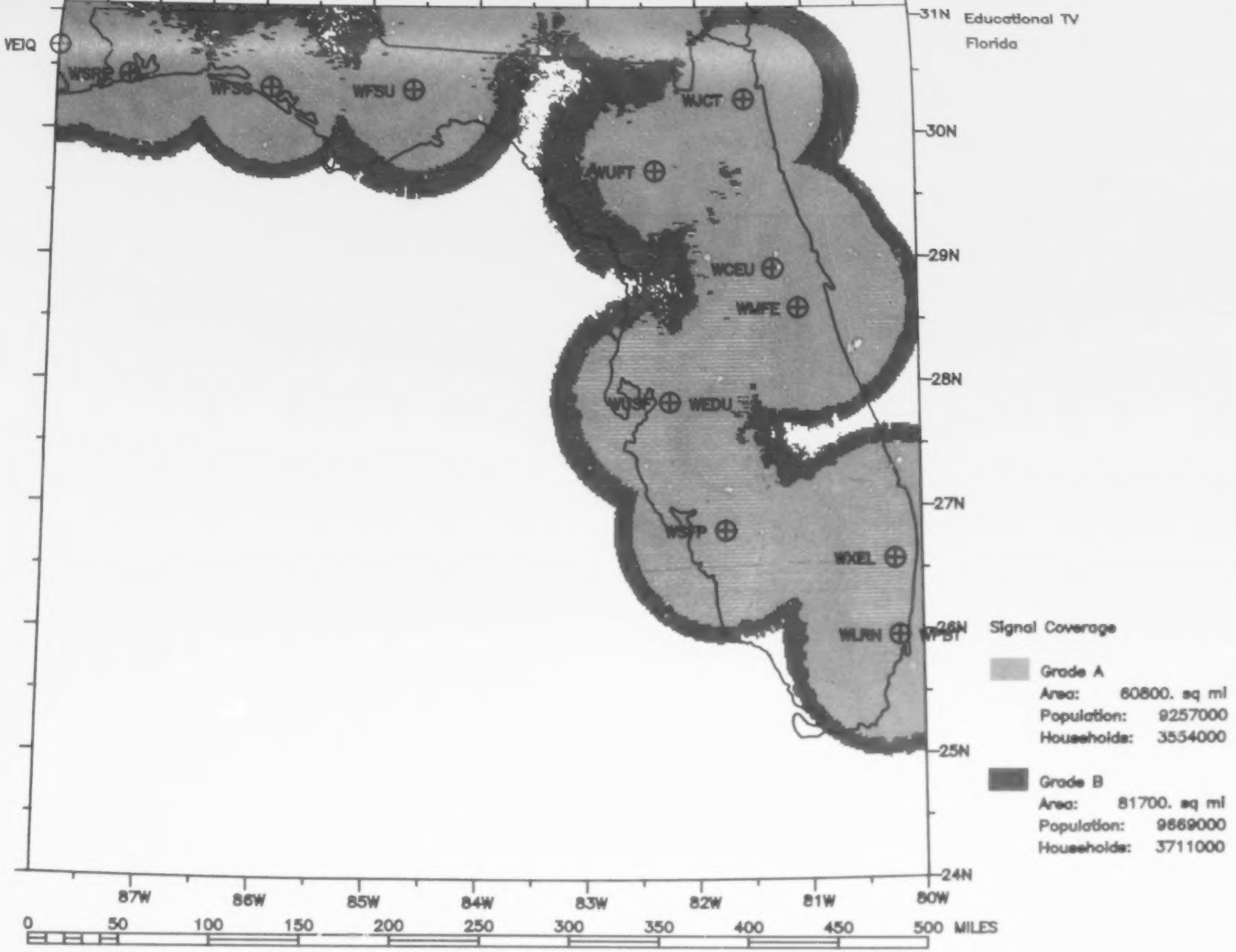
Public television is provided in Florida by 13 broadcast stations and a chain of five public television translators. The latter provide an over-the-air signal to the Florida Keys by rebroadcasting WPBT-TV, channel 2, in Miami. The public television stations in Florida are licensed to both educational institutions and nonprofit community organizations. The television translators are licensed to the Monroe County Board of Commissioners.

Uncovered Areas

Although the vast majority of the state receives public television signals from the stations listed above, some small pockets still appear to be without over-the-air service. These small areas could be covered by translators if the population density warrants it. Cable television penetration may preclude the need for translators.

Educational TV

Florida


VEIQ
WSRE
WFSG
WFSU
WJCT
WUFT
WCEU
WMFE
WUSF
WEDU
WSFP
WXEL
WLRN
WPBT
31N
30N
29N
28N
27N
26N
25N
24N
87W
86W
85W
84W
83W
82W
81W
80W
0
50
100
150
200
250
300
350
400
450
500 MILES
Signal Coverage
Grade A
Area: 60800. sq mi
Population: 9257000
Households: 3554000
Grade B
Area: 81700. sq mi
Population: 9869000
Households: 3711000

GEORGIA

Basic Statistics

Total State Population: 5,463,000

Total Population Receiving Public TV Signal: 5,393,000 (99%)

Total Population in Uncovered Areas: 70,000

Public Television Stations in State

Community	Call Letters
Athens	WGTV-TV
Atlanta	WPBA-TV
Chatsworth	WCLP-TV
Cochran	WDCO-TV
Columbus/ Warm Springs	WJSP-TV
Dawson	WACS-TV
Pelham	WABW-TV
Savannah/ Pembrook	WVAN-TV
Waycross	WXGA-TV
Wrens	WCES-TV

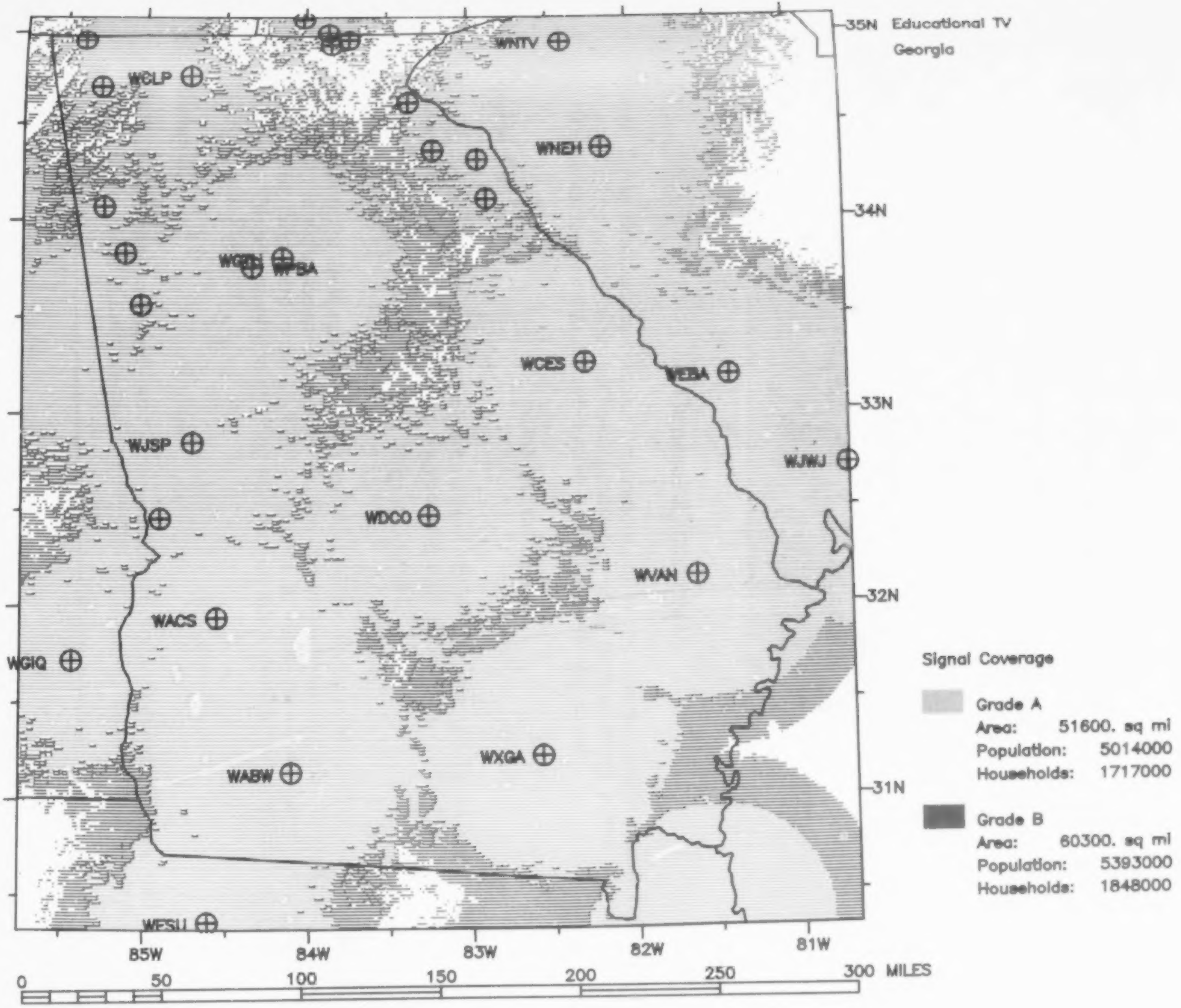
General Comments

The vast majority of Georgia's residents receive public television coverage from the Georgia Public Telecommunications Commission's nine-station network and a public station (WPBA-TV) licensed to the Atlanta Board of Education. In addition to these public stations, the state-supported public television network holds the licenses of 12 public television translators. Public television signals are also available from stations in some adjoining states.

Uncovered Areas

The Georgia Public Telecommunications Commission and WPBA-TV have been very successful in providing an over-the-air signal to most of the residents of the state. The only area noted as not being covered is the area in the northeastern corner of the state that is approximately defined by the Chattahoochee National Forest. This area appears to be rather sparsely populated; thus, total coverage may not be economically feasible.

Educational TV
Georgia


35N
34N
33N
32N
31N
85W
84W
83W
82W
81W
0
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100
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WCLP
WNEH
WGTV
WPBA
WCES
WEBA
WJSP
WJWJ
WDCO
WVAN
WACS
WGIQ
WXGA
WABW
WFSU
Signal Coverage
Grade A
Area: 51600. sq mi
Population: 5014000
Households: 1717000
Grade B
Area: 60300. sq mi
Population: 5393000
Households: 1848000

HAWAII

Basic Statistics

Total State Population:	965,000
Total Population Receiving Public TV Signal:	933,000 (97%)
Total Population in Uncovered Areas:	32,000

Public Television Stations in State

Community	Call Letters
Honolulu	KHET-TV
Maui	KMEB-TV

General Comments

Hawaii Public Broadcasting operates two stations and twelve translators that virtually cover the state. The state's cable television penetration of 70 percent brings public television to those communities that cannot receive a direct over-the-air signal.

Uncovered Areas

Region I

Translator service extends to Kekaha on the southwest corner of Kauai island. The unserved west side of Kauai is very rugged with little population.

Region II

Reception on the west side of Oahu is blocked by the Waianae Mountains with service ending at the Kahe Beach area. The Koolau Mountains block over-the-air reception to the eastern (windward) side of Oahu. Homes in these areas are served by cable television. The windward side of Oahu also receives some over-the-air television reception from the Maui station.

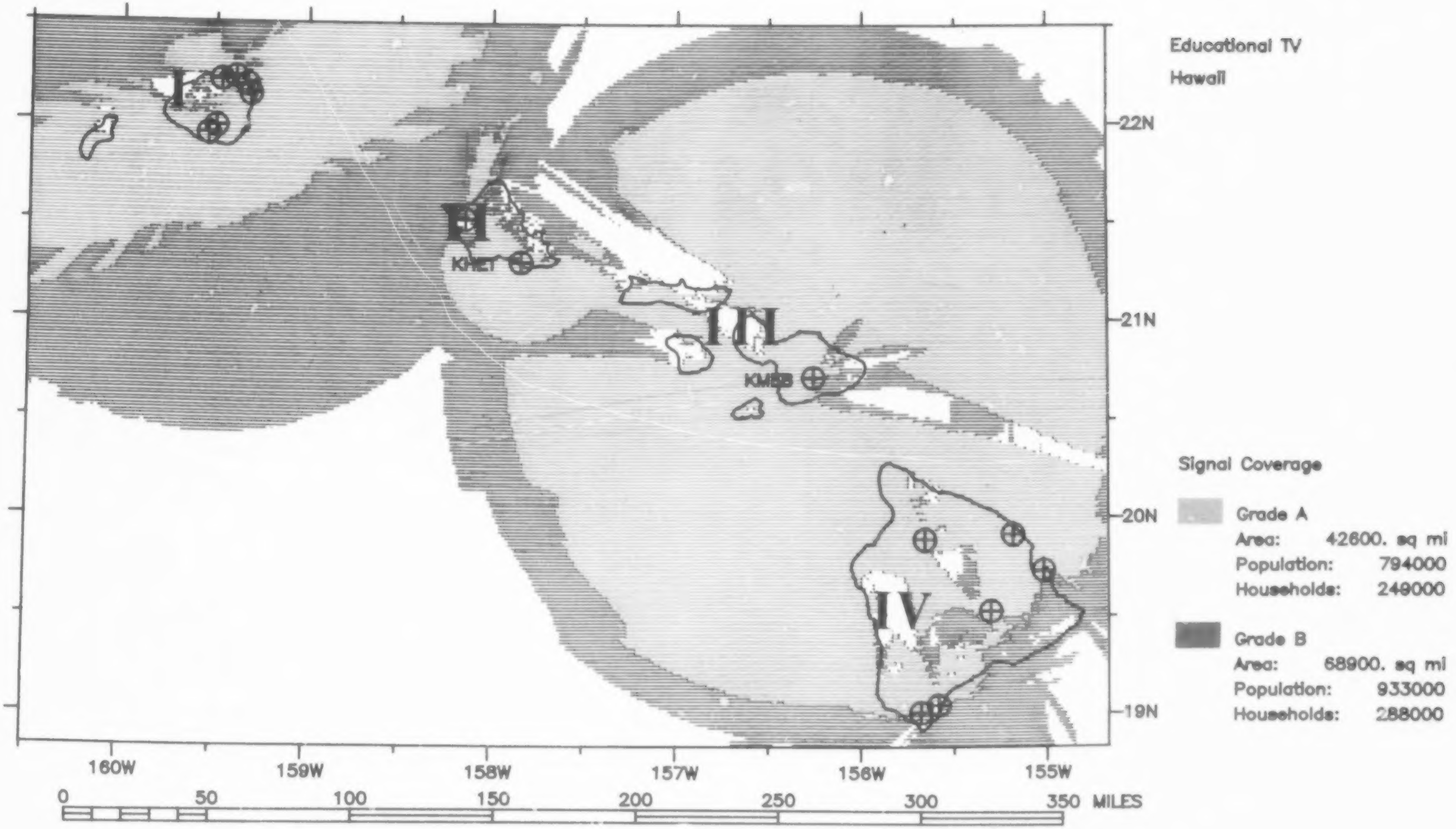
Region III

The western side of Maui has poor over-the-air coverage near Lahaina and the communities of the Kaanapali coast. Homes in the area are served by cable television.

Over-the-air reception is also poor in several locations of Lanai and Molokai islands with low populations. Lanai City is covered by cable.

Region IV

The community of Kona does not have over-the-air coverage but homes in this area are served by cable television.


Educational TV
Hawaii

I
II
KHET
III
KMEB
IV
22N
21N
20N
19N
160W
159W
158W
157W
156W
155W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Grade A
Area: 42600. sq mi
Population: 794000
Households: 249000
Grade B
Area: 68900. sq mi
Population: 933000
Households: 288000

IDAHO

Basic Statistics

Total State Population:	944,000
Total Population Receiving Public TV Signal:	864,000 (92%)
Total Population in Uncovered Areas:	80,000

Public Television Stations in State

Community	Call Letters
Boise	KAID-TV
Moscow	KUID-TV
Pocatello	KISU-TV

General Comments

Idaho is one of the most mountainous states in the Rocky Mountain region. The Continental Divide forms part of its eastern border. Because of Idaho's rugged terrain, the vast majority of the state receives public television signals via translator.

In an effort to resolve the problem of public television coverage in the state, PTFP funded two projects that were performed by the State Board of Education. The first project was the creation of a microwave "backbone" system which interconnected the three public television stations in the state (KAID-TV, KUID-TV, KISU-TV) which are located in the largest metropolitan areas. The second project was the funding of 28 television translators which are rebroadcasting statewide the signals of these three primary public broadcast stations.

Uncovered Areas

Region I

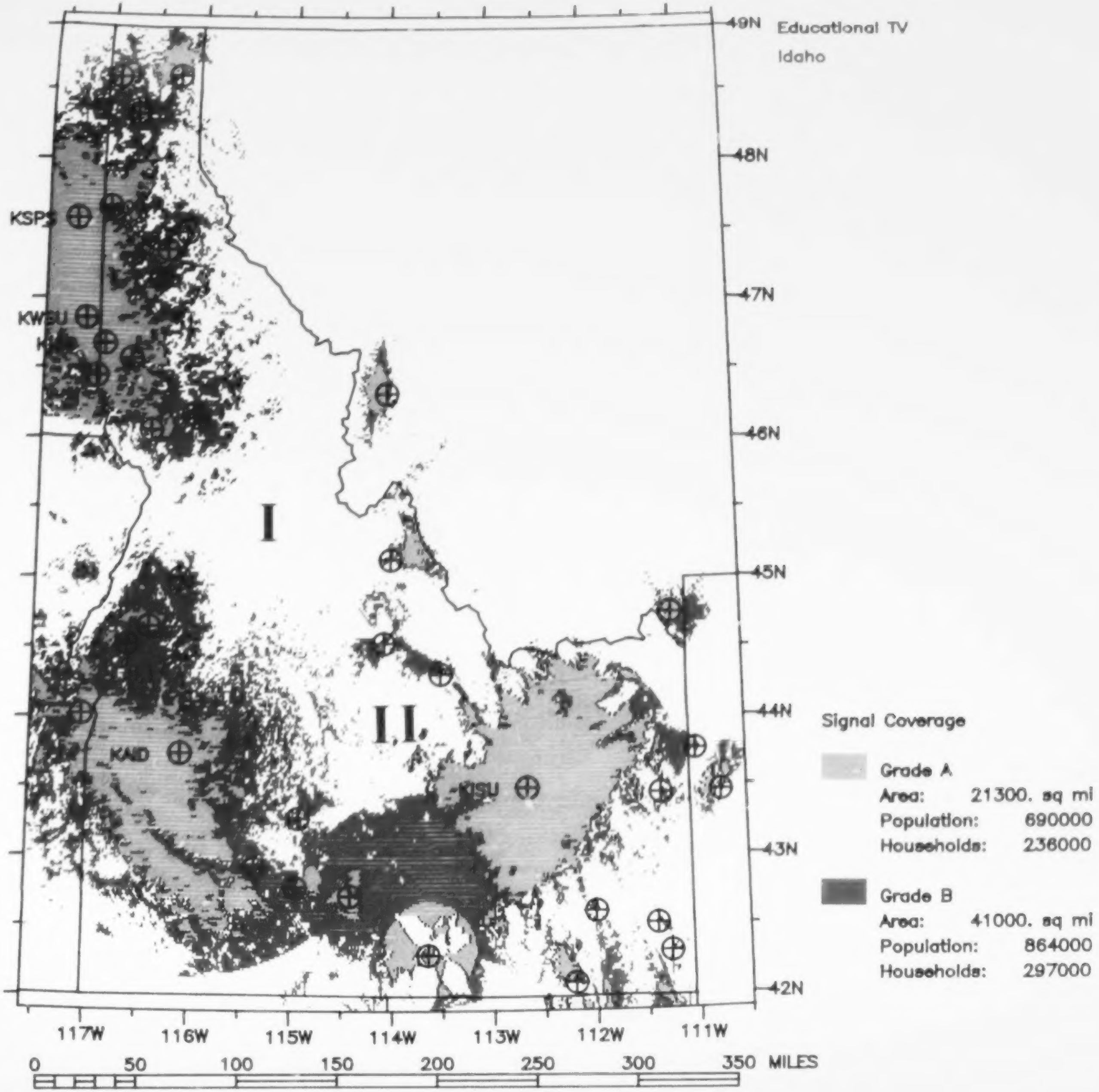
This sparsely populated region includes the Clearwater, Nez Perce and Payette National Forests, which are the three largest national forests within Idaho. The uncovered area is encircled by towns (Salmon, Grangeville, Kamiah, etc.), most of which receive public television via state translators. The towns in the center of national forests are very remote

best copy available

and generally have less than 300 people. Approximately 50,000 to 60,000 people reside in this region overall.

Region II

This region includes the Sawtooth and Challis National Forests and the Sawtooth National Recreation Area. The Idaho Educational Public Broadcasting Service (IEPBS) is projecting to serve a larger population in the Sun Valley/Ketchum/Hailey area as part of their next signal expansion. There are no current projections for developing service to the remaining smaller communities.



ILLINOIS

Basic Statistics

Total State Population: 11,427,000

Total Population Receiving Public TV Signal: 10,895,000 (95%)

Total Population in Uncovered Areas: 532,000

Public Television Stations in State

Community	Call Letters
Carbondale	WSIU-TV
Charleston	WEIU-TV
Chicago	WTTW-TV WYCC-TV
Jacksonville	WJPT-TV
Macomb	WIUM-TV
Moline	WQPT-TV
Olney	WUSI-TV
Peoria	WTVP-TV
Quincy	WQEC-TV
Urbana	WILL-TV

General Comments

The majority of Illinois receives a public television signal. Coverage is provided by a mixture of community and educational licensees. There is no state entity responsible for oversight of the development of public broadcasting.

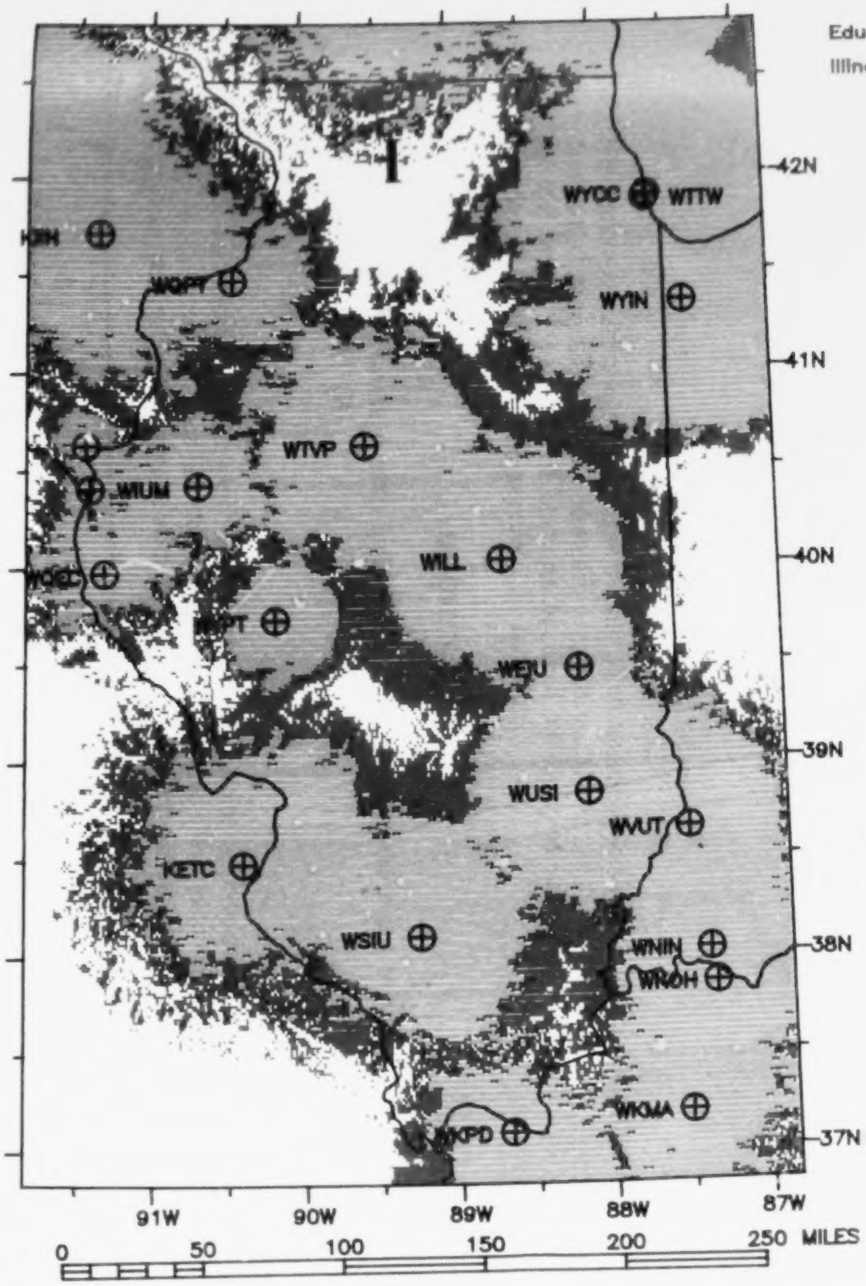
Uncovered Areas

Region I

This region is the area surrounding and including Rockford, which is the third largest community in the state. It is unserved for indeterminate reasons. Technically, a repeater station or translators from either of the three nearest stations could bring a signal to this region. A low-powered, full-service station, however, might allow the community to address its needs more directly. It appears that there is sufficient population to generate an economic base of support for a small television facility. Other, very small unserved areas exist in Illinois, but it appears that 450,000 to 500,000 persons may reside in this identified region.

Educational TV

Illinois


42N
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38N
37N
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90W
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88W
87W
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150
200
250 MILES
WYCC
WTTW
WYIN
WQPT
WTVP
WIUM
WQEC
WILL
WEIU
WUSI
WVUT
KETC
WSIU
WNIN
WNOH
WKMA
WKPD

Signal Coverage

▨ **Grade A**

Area:	38700. sq mi
Population:	9994000
Households:	3523000

■ **Grade B**

Area:	51500. sq mi
Population:	10895000
Households:	3853000

INDIANA

Basic Statistics

Total State Population:	5,490,000	
Total Population Receiving Public TV Signal:	5,231,000	(95%)
Total Population in Uncovered Areas:	259,000	

Public Television Stations in State

Community	Call Letters
Bloomington	WTIU-TV
Evansville	WNIN-TV
Ft. Wayne	WFWA-TV
Gary	WYIN-TV
Indianapolis	WFYI-TV
Muncie	WIPB-TV
South Bend	WNIT-TV
Vincennes	WVUT-TV

General Comments

Indiana receives public television signals from both university-affiliated stations and stations licensed to community-based nonprofit organizations. In addition to stations located within the state, a number of stations licensed to cities in adjoining states -- Illinois, Kentucky and Ohio -- can be received in Indiana.

Uncovered Areas

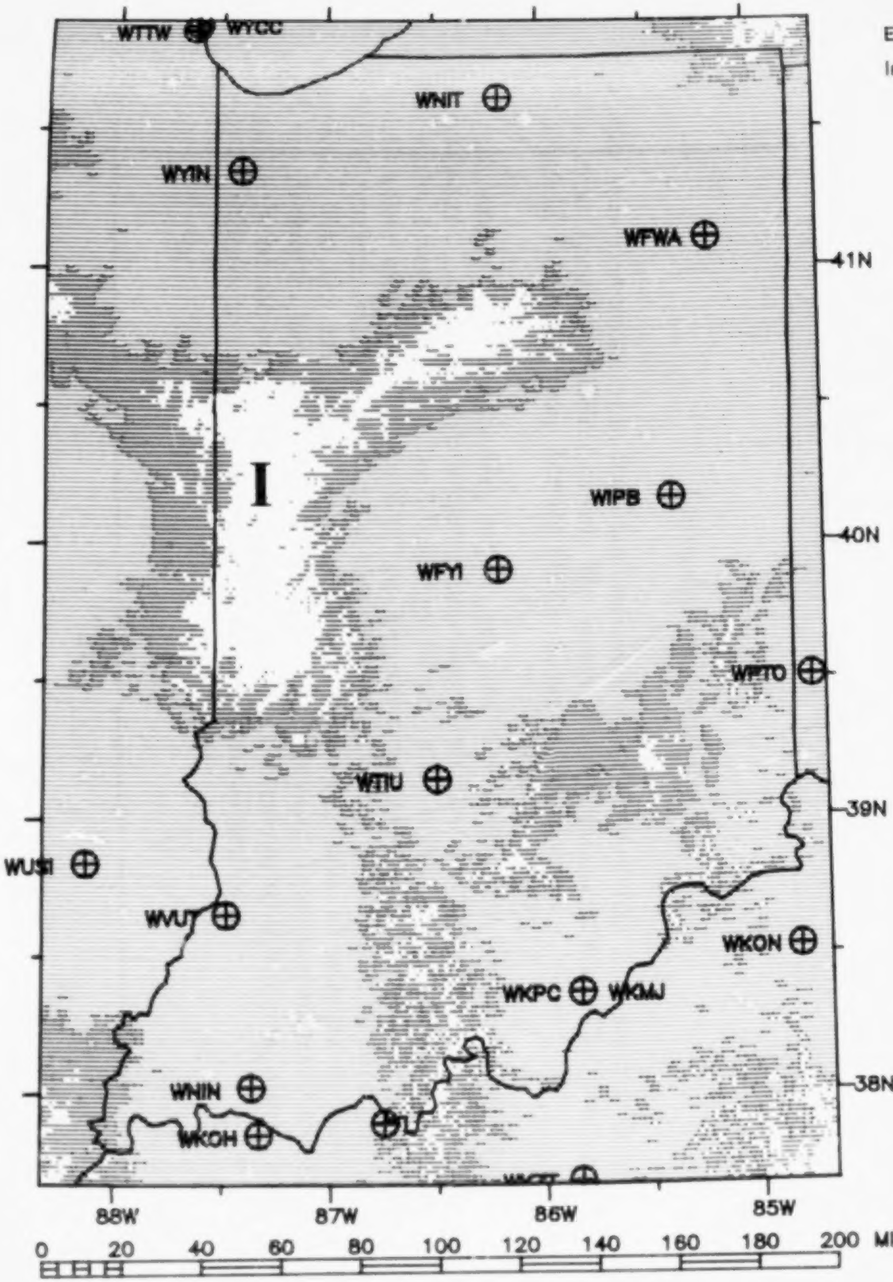
The accompanying coverage map indicates that one region does not receive over-the-air public television coverage.

Region I

This region is located in the west central part of the state approximately midway up the western boundary. It lies in the area south of the Gary station and west of the Indianapolis station. Since this is such a large area, either a new full-service public station or a repeater/satellite station of an existing station may be the most feasible means of providing coverage.

Educational TV

Indiana


WTTW
WYCC
WNIT
WYIN
WFWA
41N
I
WIPB
40N
WFYI
WFTO
WTIU
39N
WUSI
WVUT
WKON
WKPC
WKMJ
38N
WNIN
WKOH
88W
87W
86W
85W
0
20
40
60
80
100
120
140
160
180
200 MILES

Signal Coverage

▨ Grade A

Area:	29200. sq mi
Population:	4806000
Households:	1684000

▇ Grade B

Area:	34200. sq mi
Population:	5231000
Households:	1834000

IOWA

Basic Statistics

Total State Population:	2,914,000
Total Population Receiving Public TV Signal:	2,818,000 (97%)
Total Population in Uncovered Areas:	96,000

Public Television Stations in State

Community	Call Letters
Council Bluffs	KBIN-TV
Des Moines	KDIN-TV
Fort Dodge	KTIN-TV
Iowa City	KIIN-TV
Mason City	KYIN-TV
Red Oak	KHIN-TV
Sioux City	KSIN-TV
Waterloo	KRIN-TV

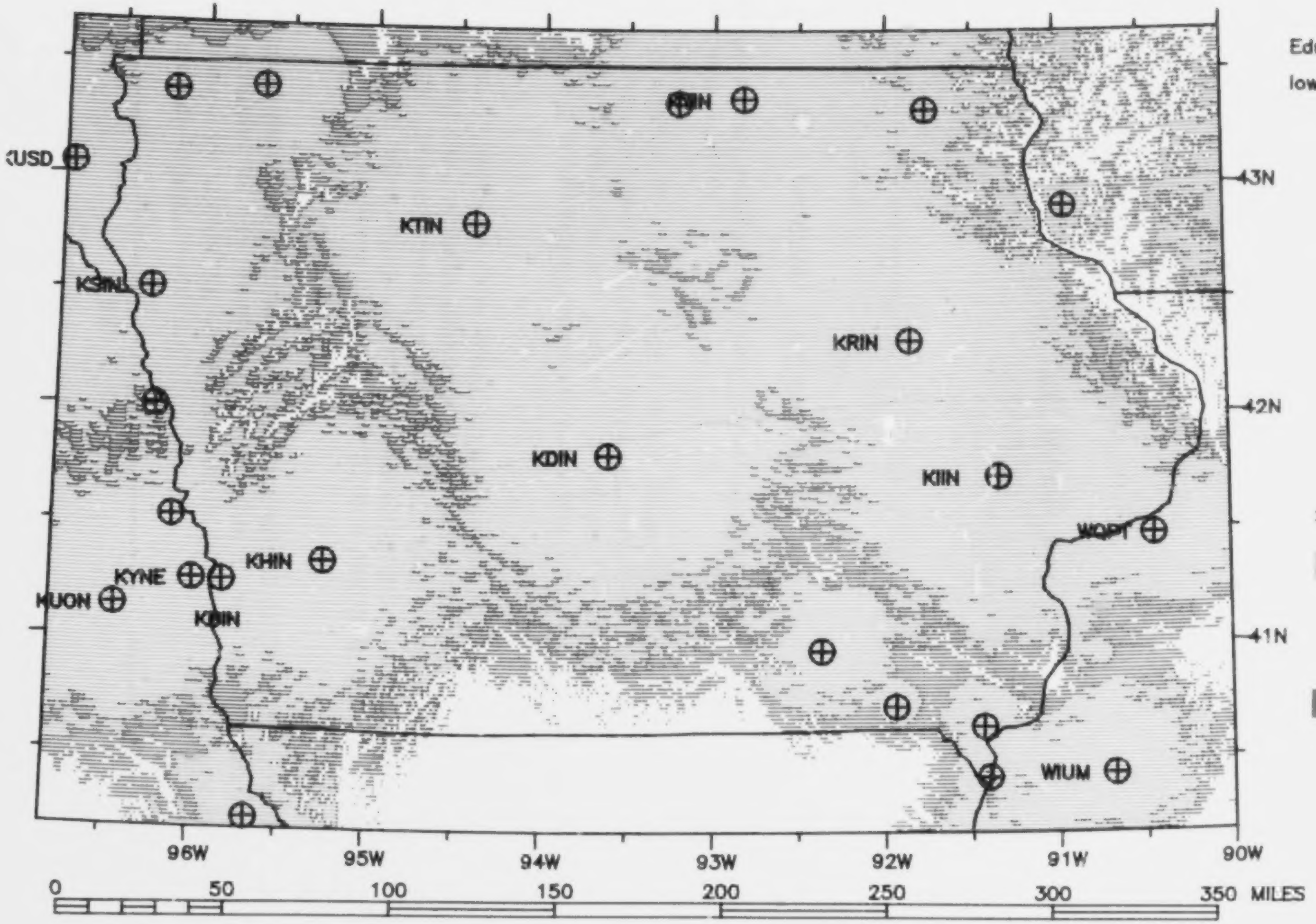
General Comments

Public television activities in Iowa are managed by the Iowa Public Broadcasting Board. The state system effectively covers the entire state with over-the-air broadcast and Instruction Television Fixed Service (ITFS) nonbroadcast systems.

Iowa's terrain is relatively flat, which presents few difficulties for broadcast signal propagation. Only the northeastern boundary does not receive reliable over-the-air television coverage. This is the Mississippi River Valley region. There, bluffs along the river's route often rise 100' to 200' and impede signal reception. The majority of the 96,000 persons unserved by over-the-air public television in Iowa would be found in this region. The city and county of Dubuque, for example, have no over-the-air service, although they do have an extensive cable television service. Television translators would most likely be the technology of choice to complete coverage to this region, although it may be difficult to justify such construction on economic grounds.

Educational TV

Iowa



KUSD
KTIN
KSIN
KYNE
KUON
KBIN
KHIN
KDIN
KRIN
KIIN
WQPT
WIUM
43N
42N
41N
96W
95W
94W
93W
92W
91W
90W
0
50
100
150
200
250
300
350 MILES

Signal Coverage

░ Grade A
Area: 45800. sq mi
Population: 2591000
Households: 936000

▓ Grade B
Area: 52400. sq mi
Population: 2818000
Households: 1019000

KANSAS

Basic Statistics

Total State Population:	2,364,000
Total Population Receiving Public TV Signal:	2,005,000 (85%)
Total Population in Uncovered Areas:	359,000

Public Television Stations in State

Community	Call Letters
Bunker Hill	KOOD-TV
Lakin	KSWK-TV
Topeka	KTWU-TV
Wichita	KPTS-TV

General Comments

Most of the Kansas population receives a reliable public television signal, either over the air or via cable television.

The Kansas coverage is attributable in large part to three full-service stations and a major satellite repeater; the latter, in Lakin, is rebroadcasting the service of channel 9, Bunker Hill. These stations are autonomous, not part of a centralized state system. Kansas, however, does have a public broadcasting committee that makes funding recommendations to the State Legislature.

Translators in Iola/Moran, Phillipsburg, Concordia, Hoxie, Quinter, Atwood, and Natoma (the latter two broadcasting the Nebraska Educational Telecommunications Commission signal) help round out the present coverage picture. In addition, the signal of KOZJ-TV, channel 26, from Joplin, Missouri, protrudes significantly into far southeast Kansas. Signals from translators of the Oklahoma Educational Television Authority penetrate south central Kansas.

Most of Kansas' unserved areas are extremely sparsely populated. It therefore appears unlikely that the construction of any more full-service stations will occur. Further coverage could be achieved by translators, or by the construction of a major repeater station in extreme southeast Kansas.

Uncovered Areas

The unserved areas of Kansas may be divided into four regions.

Region I

Region I is the northwest corner of the State. Presently, only a couple of translators provide over-the-air service. Many of the area's communities, however, have cable television systems carrying some public television signal, sometimes from Nebraska stations.

If everything goes according to plan, a series of four translators will be constructed in this region over the next one to two years. The translators will be located in Goodland, Oakley, Oberlin, and Norton. They will be operated by, and rebroadcast the signal of, Smoky Hills Public Television, which is the licensee of KOOD, channel 9, Bunker Hill.

When these four new translators go on-air, most of this region will have coverage. Representatives of KOOD say that Wallace County, which borders Colorado, may still lack service, but that this could be rectified by another translator. Also, other remaining "white areas" are not likely to be served by cable television systems carrying public television.

Region II

This region is the sparsely populated area of south central Kansas that lies between the contours of KSWK, KOOD, and KPTS. A glance at the list of communities served by cable television carrying the signal of KPTS (Wichita) indicates that most of the region's population probably does have access to public television. The city of Pratt and Dodge City receive a public television signal through a cable television system.

Region III

The region located in north central Kansas is bounded by the contours of the KOOD translator in Concordia (channel 64), KOOD itself, KPTS, and KTWU. The major urban centers at the edges of this unserved region tend to be within the Grade B contour of one or another of the major stations. Salina receives KPTS from Wichita, for example, while Manhattan, Junction City and Abilene receive KTWU off-air from Topeka. Abilene is at the far reaches of KTWU's signal, but the city's cable television system carries the station. A public television official in the area suggested that this region would best be covered by two translators and advised that a full-fledged station would not be called for.

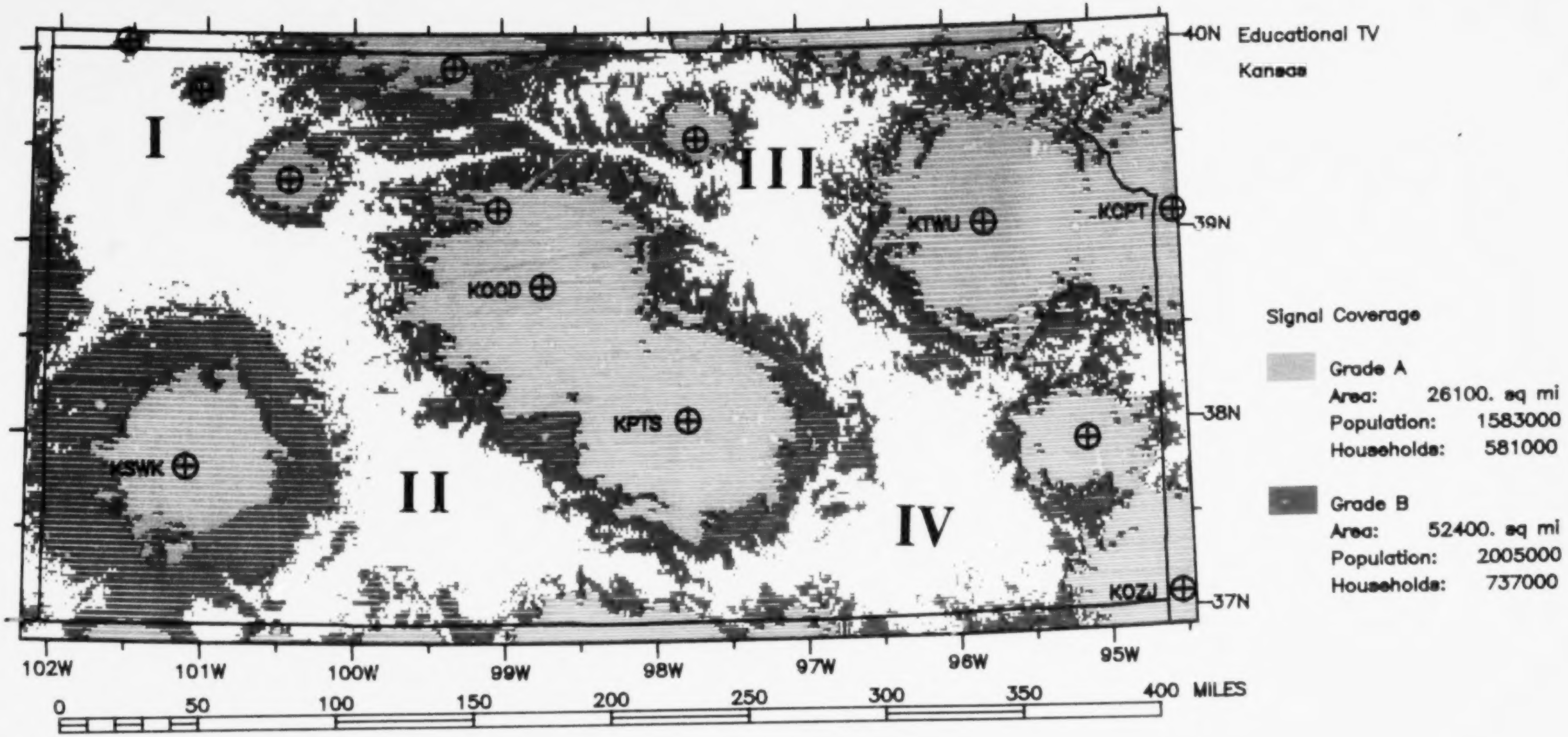
Region IV

This region, located in south central Kansas, is bound by the contours of stations KPTS, KTWU, KOZJ (from Joplin, MO), and the KTWU translator on channel 30 in

Iola/Moran. The southern boundary of the region is the Kansas-Oklahoma state line. This region contains the Flint Hills and tends to be sparsely populated; the combined population of Elk and Chautauqua Counties is approximately 9,000. Some over-the-air coverage is achieved here thanks to the signal of KOZJ from Joplin. But this signal apparently reaches only the far corner of the state and does not penetrate as far west as Parsons in any reliable way.

A consortium composed of seven community colleges and Pittsburg State University, all located in the southeast part of this region, has expressed interest in sponsoring some sort of over-the-air coverage from a Kansas-based signal for this region. The consortium is seeking funding to conduct a feasibility study that would determine which technology and engineering configuration would be most cost-effective.

Numerous communities in this region have cable television systems. These systems -- such as those in Parsons and Independence, for example -- tend to carry the public television signal of the Oklahoma Educational Television Authority, although some carry KOZJ.


Educational TV

Kansas

40N
39N
38N
37N
102W
101W
100W
99W
98W
97W
96W
95W
0
50
100
150
200
250
300
350
400 MILES
I
II
III
IV
KSWK
KOOD
KPTS
KTWU
KCPT
KOZJ
Signal Coverage
Grade A
Area: 26100. sq mi
Population: 1583000
Households: 581000
Grade B
Area: 52400. sq mi
Population: 2005000
Households: 737000

KENTUCKY

Basic Statistics

Total State Population:	3,661,000	
Total Population Receiving Public TV Signal:	3,528,000	(96%)
Total Population in Uncovered Areas:	133,000	

Public Television Stations in State

Community	Call Letters
Ashland	WKAS-TV
Bowling Green	WKGB-TV
	WKYU-TV
Covington	WCVN-TV
Elizabethtown	WKZT-TV
Hazard	WKHA-TV
Lexington/ Richmond	WKLE-TV
Louisville	WKMJ-TV
	WKPC-TV
Madisonville	WKMA-TV
Morehead	WKMR-TV
Murray/ Mayfield	WKMU-TV
Owensboro/ Henderson	WKOH-TV
Owenton	WKON-TV
Paducah	WKPD-TV
Pikeville	WKPI-TV
Somerset	WKSO-TV

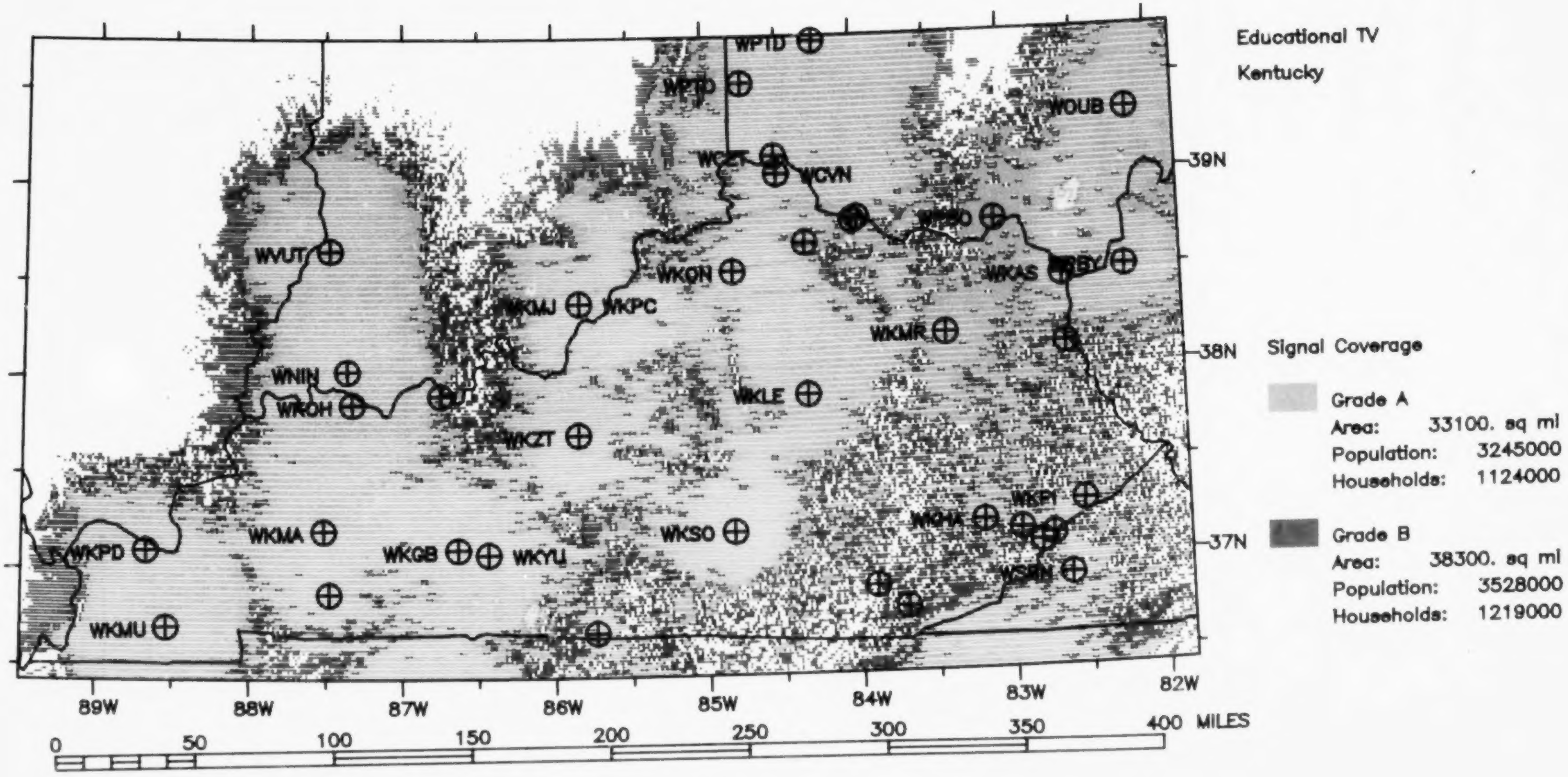
General Comments

Most public television is provided to the residents of Kentucky by means of a state-supported network, the Kentucky Authority for Educational Television. The state network has its headquarters in Lexington and consists of 15 stations and 11 television translators.

This network is complemented by two additional public television stations: WKPC, a community-licensed station in Louisville, and WKYU, licensed to Western Kentucky University in Bowling Green. Still other public television signals are provided from adjacent states.

Uncovered Areas

The state public television network covers virtually the entire state with an over-the-air signal. The only exception is in the Daniel Boone National Forest where coverage is hampered by terrain considerations. Additional television translators as well as cable television are perhaps the most viable means of providing improved service to this area.



WPTD
WPTO
WOUB
WCET
WCVN
WVUT
WKON
WKMJ
WKPC
WKAS
WKMR
WNIN
WKOH
WKLE
WKZT
WKPI
WKHA
WKMA
WKGB
WKYU
WKSO
WSRN
WKPD
WKMU
39N
38N
37N
89W
88W
87W
86W
85W
84W
83W
82W
0
50
100
150
200
250
300
350
400 MILES

Educational TV

Kentucky

Signal Coverage

▨ Grade A

Area: 33100. sq mi

Population: 3245000

Households: 1124000

■ Grade B

Area: 38300. sq mi

Population: 3528000

Households: 1219000

LOUISIANA

Basic Statistics

Total State Population:	4,206,000
Total Population Receiving Public TV Signal:	4,206,000 (100%)
Total Population in Uncovered Areas:	0

Public Television Stations in State

Community	Call Letters
Alexandria	KLPA-TV
Baton Rouge	WLPB-TV
Lafayette	KLPB-TV
Lake Charles	KLTL-TV
Monroe	KLTM-TV
New Orleans	WLAE-TV WYES-TV
Shreveport	KLTS-TV

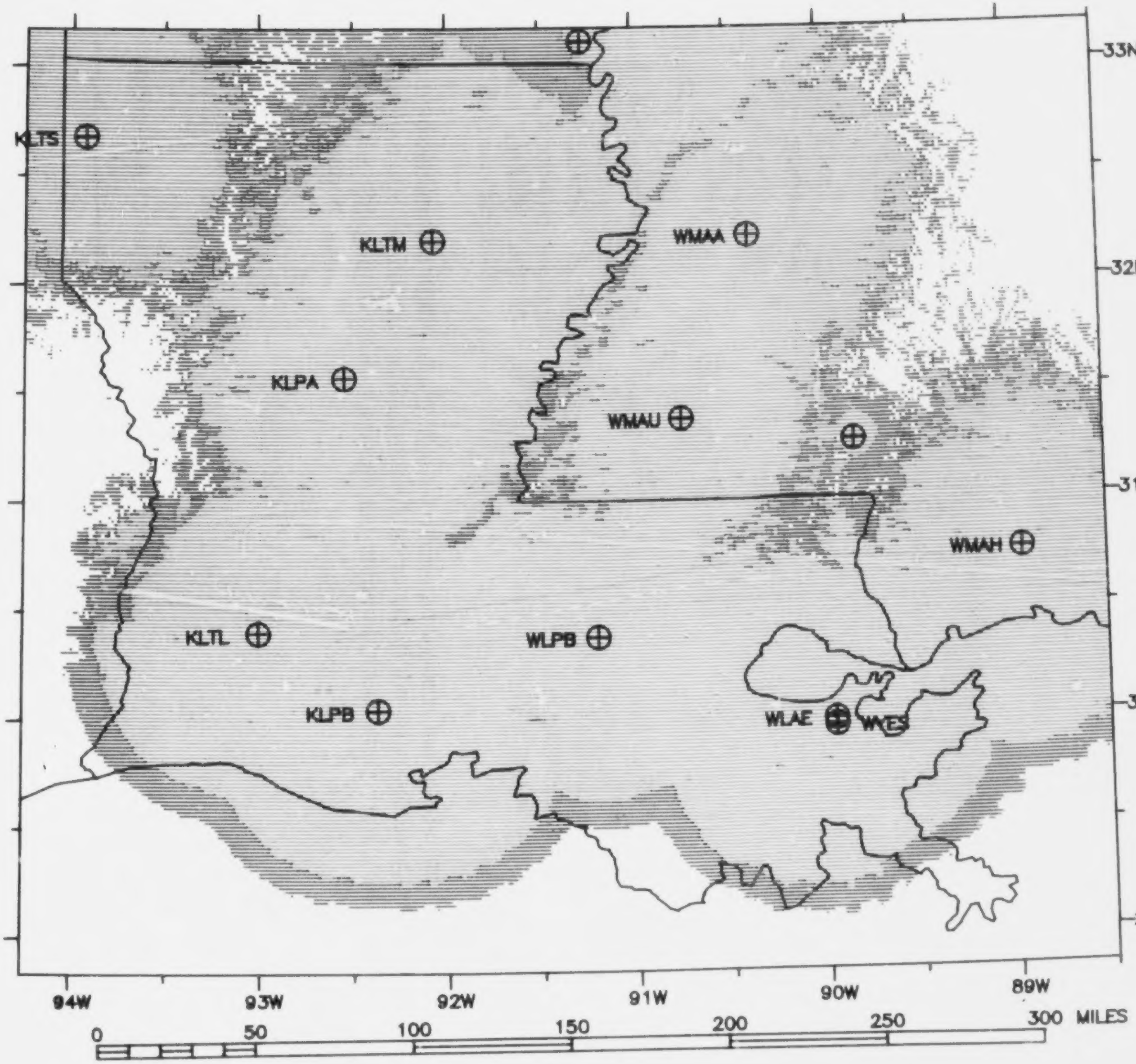
General Comments

Louisiana receives public television both from state-managed stations and autonomous stations. Six of the stations listed above are administered by a state-owned public television entity, the Louisiana Educational Television Authority, which has its headquarters in Baton Rouge. Further coverage is provided by two community-licensed public stations (WLAE-TV and WYES-TV), both located in New Orleans.

Uncovered Areas

The study's population coverage calculations indicate that virtually all of Louisiana is served by a public television signal.

Educational TV
Louisiana



KLTS
KLTM
WMAA
KLPA
WMAU
WMAH
KLTL
WLPB
KLPB
WLAE
WYES
33N
32N
31N
30N
29N
94W
93W
92W
91W
90W
89W
0
50
100
150
200
250
300 MILES

Signal Coverage

▨ Grade A
Area: 46200. sq mi
Population: 4071000
Households: 1368000

▨ Grade B
Area: 52800. sq mi
Population: 4206000
Households: 1418000

MAINE

Basic Statistics

Total State Population:	1,125,000
Total Population Receiving Public TV Signal:	1,073,000 (95%)
Total Population in Uncovered Areas:	52,000

Public Television Stations in State

Community	Call Letters
Augusta	WCBB-TV
Biddeford	WMEA-TV
Calais	WMED-TV
Orono	WMEB-TV
Presque Isle	WMEM-TV

General Comments

Virtually the entire population of Maine receives at least one public television signal. The University of Maine System, which has its major studios in Bangor, operates four of the above-noted stations. A community entity, Colby-Bates-Bowdoin Educational Telecommunications Corporation, located in Lewiston, is the licensee of the remaining station, WCBB in Augusta. WCBB operates three translators that provide signals to the communities of Bethel, Harrison and Skowhegan.

Mountains dominate the Maine landscape, especially the western half of the state. Public television coverage follows the well-populated areas along the Atlantic Coast, extending north along the Canadian border. Although the mountains represent a major land mass, they are sparsely populated.

Uncovered Areas

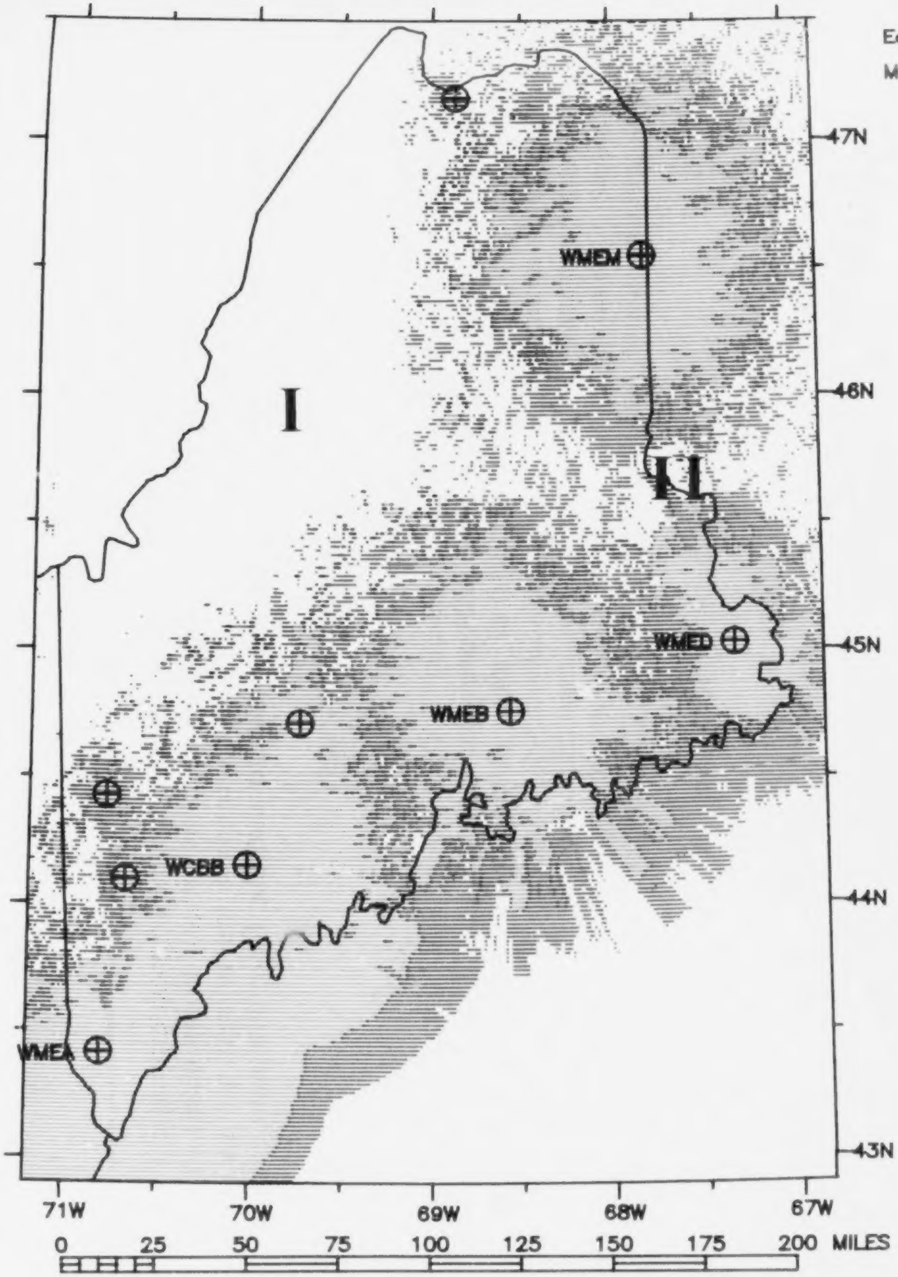
Region I

This region is a mountainous area with an extremely low population density.

Region II

This region, which is located between the signal contours of WMEM and WMED, is the only unserved area in the populated portion of the state. It is composed of hilly terrain and has a low population density. Translators could be used here. The economic feasibility and Canadian border problems, however, would have to be carefully assessed before any action was taken.

Educational TV
Maine


47N
46N
45N
44N
43N
71W
70W
69W
68W
67W
0
25
50
75
100
125
150
175
200 MILES
I
II
WMEM
WMED
WMEB
WCBB
WMEA

Signal Coverage

▨ Grade A
Area: 20800. sq mi
Population: 963000
Households: 338000

▩ Grade B
Area: 32700. sq mi
Population: 1073000
Households: 377000

MARYLAND

Basic Statistics

Total State Population:	4,217,000
Total Population Receiving Public TV Signal:	4,168,000 (99%)
Total Population in Uncovered Areas:	49,000

Public Television Stations in State

Community	Call Letters
Annapolis	WMPT-TV
Baltimore	WMPB-TV
Frederick	WFPT-TV
Hagerstown	WWPB-TV
Oakland	WGPT-TV
Salisbury	WCPB-TV

General Comments

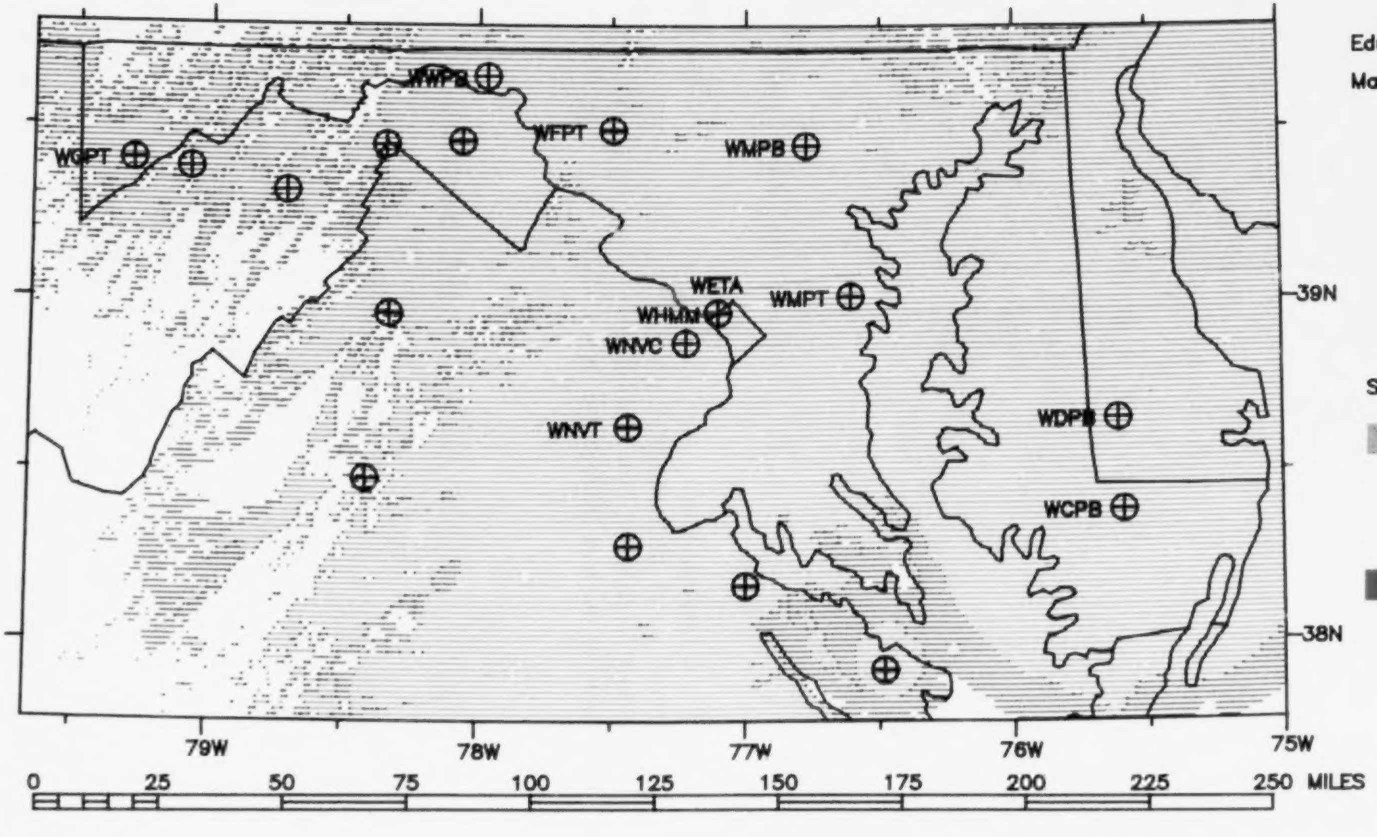
The Maryland Public Television Commission (MPTC) is the state government entity which provides a statewide public television service to Maryland residents. The network's production facilities are located in the Baltimore metropolitan area (Owings Mills) and the signal is transmitted by a network of repeater stations strategically located throughout the state. Several of the "repeater stations" have limited local origination capability. In addition to the MPTC signals, some regions of the state also receive additional public television signals from Delaware, Pennsylvania, Virginia, West Virginia and the District of Columbia.

Uncovered Areas

Although almost the entire state appears to receive at least one public television signal, service to the extreme western part of the state is certainly less reliable due to the mountainous terrain. To compensate for the effect of the terrain on the reception of over-the-air public television signals, MPTC stations are carried on local cable television systems in such towns as Cumberland, Friendsville, Frostburg and Grantsville. Because of the low population density of this area, service via television translators may be the only viable alternative for providing an over-the-air public television signal to this area.

Educational TV

Maryland


WWPB
WGPT
WFPT
WMPB
WETA
WHMM
WMPT
WNVC
WNVT
WDPB
WCPB
39N
38N
79W
78W
77W
76W
75W
0
25
50
75
100
125
150
175
200
225
250 MILES

Signal Coverage

▨ Grade A

Area:	11100. sq mi
Population:	4115000
Households:	1426000

■ Grade B

Area:	11800. sq mi
Population:	4168000
Households:	1444000

MASSACHUSETTS

Basic Statistics

Total State Population:	5,737,000
Total Population Receiving Public TV Signal:	5,534,000 (96%)
Total Population in Uncovered Areas:	203,000

Public Television Stations in State

Community	Call Letters
Boston	WGBH-TV WGBX-TV
Springfield	WGBY-TV

General Comments

The vast majority of Massachusetts residents receive a public television signal. The WGBH Educational Foundation, a community-based nonprofit organization, is the licensee for all three public television stations in the state. The Boston and Springfield stations, however, are operated as separate facilities. WGBY, the Springfield station, is located in very hilly terrain.

Uncovered Areas

Region I

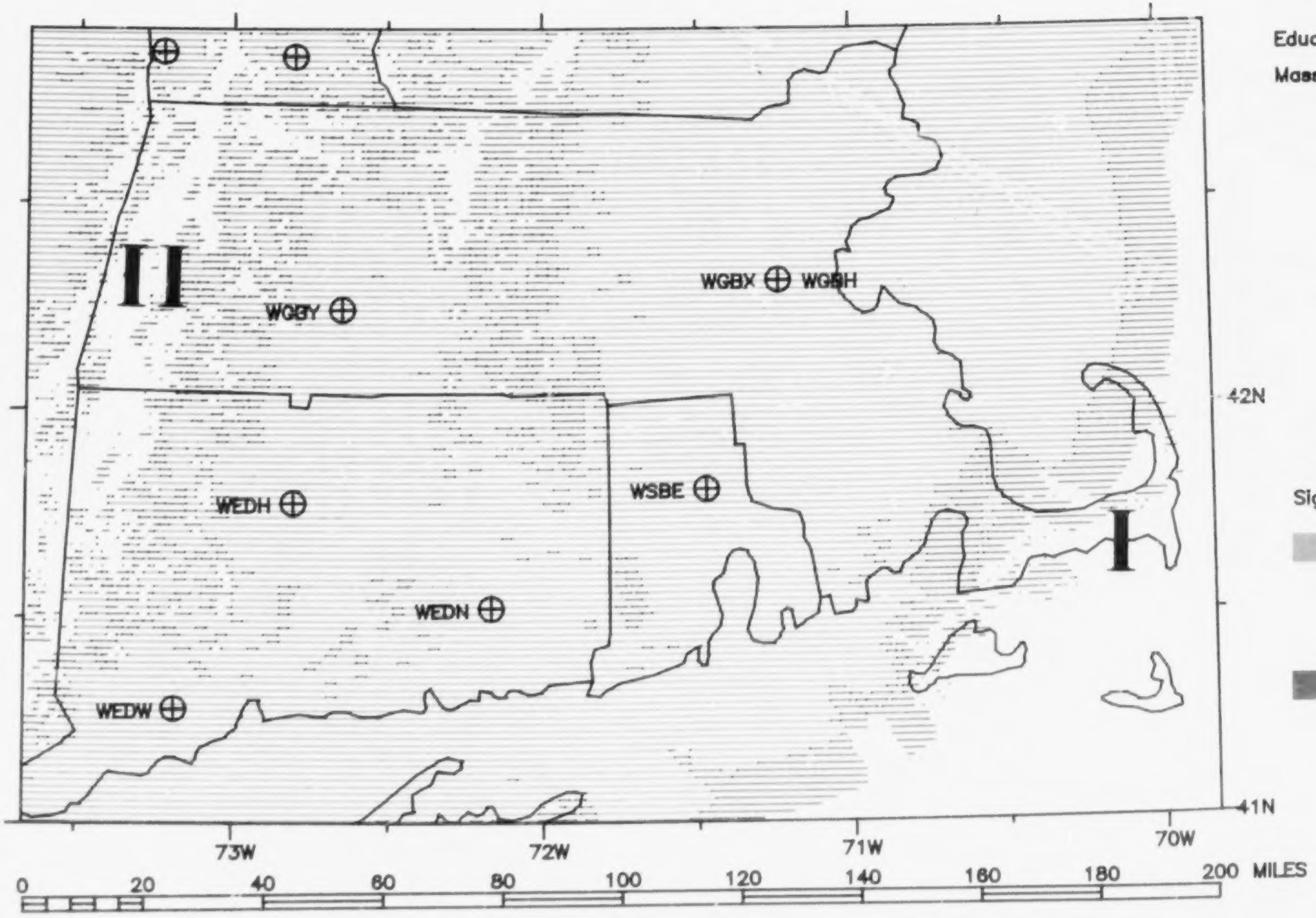
This region includes much of Cape Cod as well as two islands, Martha's Vineyard and Nantucket. Much of the Cape is unserved because of the distance from WGBH's signal. However, WGBH is installing a television translator with an ERP of 100 watts on Cape Cod. It is expected to be operational in 1989. The Cape is heavily cabled and the translator will feed the cable head-ends as well as provide an over-the-air signal.

Region II

This region is a sparsely populated area in the Berkshire Hills with many pockets not receiving a public television signal. Some portions of the unserved area surrounding WGBY could possibly be picked up by a power increase or installation of translators.

Educational TV

Massachusetts


II
I
WGBX
WGBH
WGBY
WEDH
WEDN
WSBE
WEDW
42N
41N
73W
72W
71W
70W
0
20
40
60
80
100
120
140
160
180
200 MILES

Signal Coverage

▨ Grade A
Area: 8200. sq mi
Population: 5317000
Households: 1874000

▨ Grade B
Area: 10600. sq mi
Population: 5534000
Households: 1954000

MICHIGAN

Basic Statistics

Total State Population:	9,262,000
Total Population Receiving Public TV Signal:	9,262,000 (100%)
Total Population in Uncovered Areas:	0

Public Television Stations in State

Community	Call Letters
Alpena	WCML-TV
Bad Axe	WUCX-TV
Cadillac	WCMV-TV
Detroit	WTVS-TV
East Lansing	WKAR-TV
Flint	WFUM-TV
Grand Rapids	WGVU-TV
Kalamazoo	WGVK-TV
Manistee	WCMW-TV
Marquette	WNMU-TV
Mount Pleasant	WCMU-TV
University Ctr	WUCM-TV

General Comments

The majority of residents in Michigan receive an over-the-air public television signal from public stations licensed either to educational institutions or to WTVS-TV, in Detroit. The latter is licensed to the Detroit Educational Television Foundation, a nonprofit community-supported educational organization. In addition to these full-service stations, several public television translators also provide signals to parts of the state. Signals from adjoining states can also be received along the common boundaries.

Uncovered Areas

Two regions of the state that are either without a public signal or have diminished signal strength have been identified:

Region I

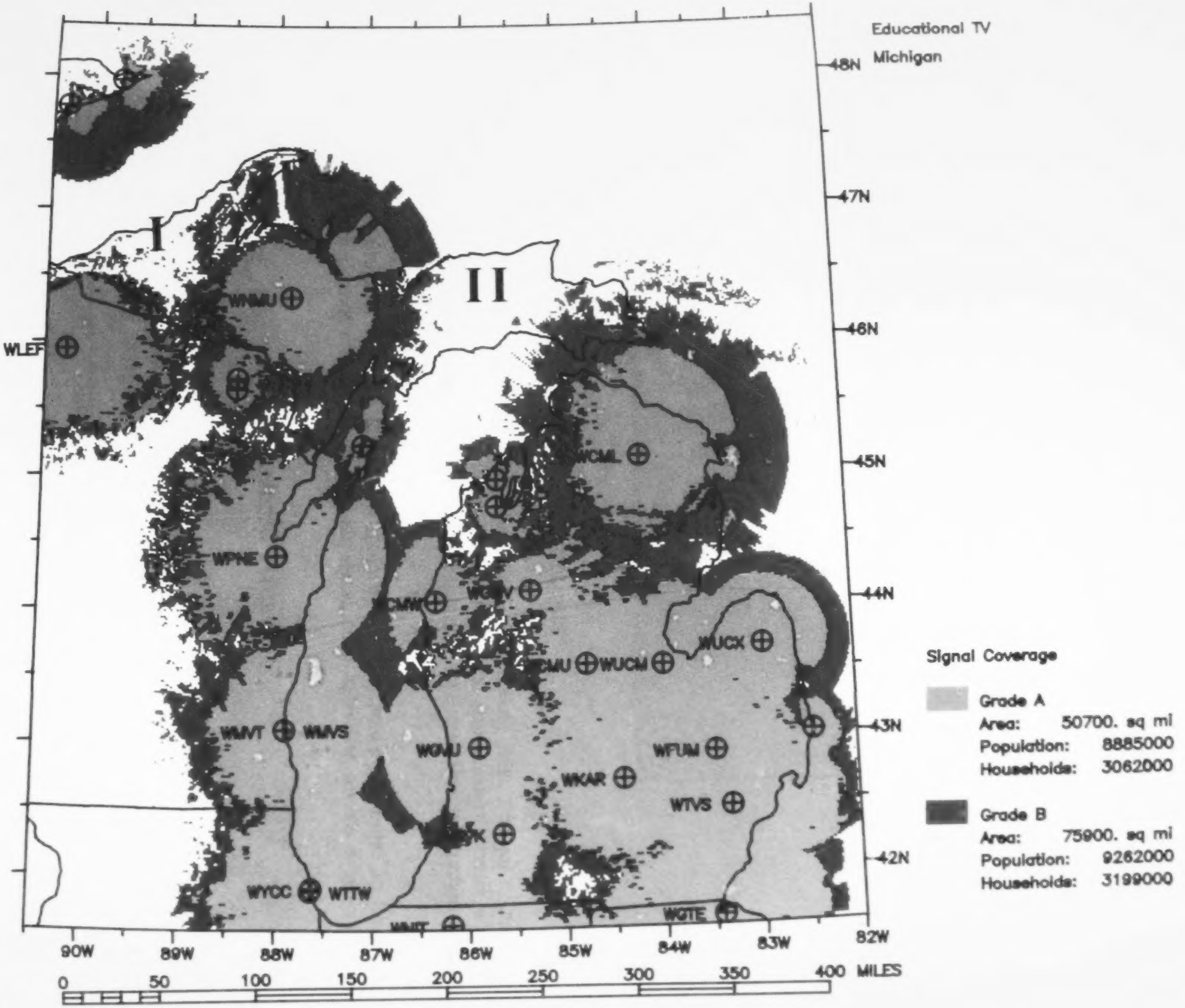
This region is located in the northwestern part of the Upper Peninsula of Michigan. This area, west of the Marquette station (WNMU-TV), consists of small towns. The Ottawa National Forest appears to cover a large portion of the area which does not receive a strong signal. Marquette public television officials indicate that the WNMU-TV signal is also transmitted via microwave to a cable television facility in Ironwood. Thus, the area furthest west in the state receives public television via cable in addition to the over-the-air signal from WLEF-TV. Television translators appear to be one feasible means of increasing the availability of a public signal to other non-cabled parts of this area.

Region II

This region is on Michigan's Upper Peninsula and is located east of the Marquette station (WNMU-TV). This area includes parts of Luce, Mackinac and Schoolcraft Counties. It essentially consists of the area between the western and eastern parts of the Hiawatha National Forest. These counties are quite sparsely populated and only have a few small towns.

A series of translators would appear to be the only realistic and economically attainable means of providing public television to this area. Unfortunately, the lack of population concentration in this region may make even this approach impractical.

Educational TV
Michigan


WLEF
WNMU
I
II
WPNE
WCML
WCMW
WUCX
WCMU
WUCM
WMVT
WMVS
WGVU
WFUM
WKAR
WTVS
WYCC
WTTW
WNIT
WGTE
48N
47N
46N
45N
44N
43N
42N
90W
89W
88W
87W
86W
85W
84W
83W
82W
0
50
100
150
200
250
300
350
400 MILES
Signal Coverage
Grade A
Area: 50700. sq mi
Population: 8885000
Households: 3062000
Grade B
Area: 75900. sq mi
Population: 9262000
Households: 3199000

MINNESOTA

Basic Statistics

Total State Population:	4,076,000
Total Population Receiving Public TV Signal:	3,745,000 (92%)
Total Population in Uncovered Areas:	331,000

Public Television Stations in State

Community	Call Letters
Appleton	KWCM-TV
Austin	KSMQ-TV
Bemidji	KAWE-TV
Duluth	WDSE-TV
St. Paul	KTCA-TV KTCI-TV

General Comments

Most of Minnesota's terrain is relatively flat, with some rolling hills. Major terrain changes occur only in the Mississippi River Valley, along the southeastern border with Wisconsin. Two major metropolitan areas, (Minneapolis/St. Paul and Duluth) contain the majority of the population.

Over-the-air coverage is available to the vast majority of Minnesota's residents. In those rural areas which do not receive an over-the-air signal, cable television service is generally not available.

Uncovered Areas

Region I

This area includes Cottonwood, Jackson, Nobles, Rock, Pipestone, and Murray Counties in the southwest corner of the state. These counties are covered with small farming towns with limited cable service (usually about 45 percent penetration). Since most of the towns are covered by cable, it is considered inefficient to provide translator service to these areas as well.

Region II

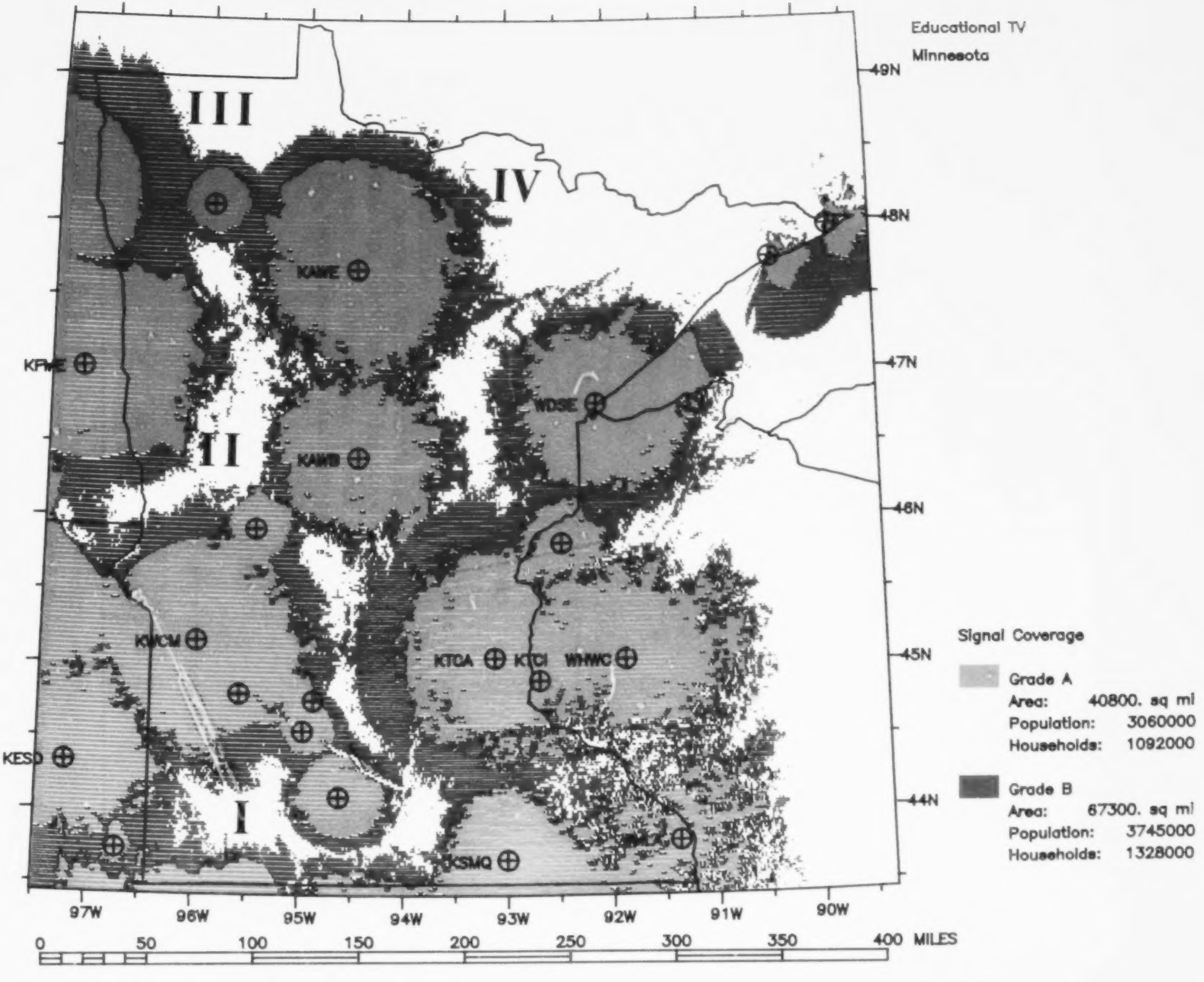
The area between Alexandria and Fargo/Moorhead is not presently served by public television. The communities in this area are very small farming towns which have limited cable penetration. Television translators would represent the most realistic way to provide public television service to the area.

Region III

The area between Bemidji and Lake of the Woods is quite limited in population. A translator serves Thief River Falls, the largest town in the area. The balance of the area includes the Beltrami Island State Forest and the Red Lake Indian Reservation. Those areas with population centers are presently served by cable.

Region IV

The northeast corner of the state is nearly all Federal- and state-controlled land. The primary population centers are found between Grand Rapids and Ely along what used to be the Mesabi and Vermillion Iron Ranges. Public television coverage is limited to over-the-air service within the Duluth/Superior area and limited cable service to larger towns along the Iron Range. The other smaller towns in the region are not presently served.


Educational TV
Minnesota
III
IV
II
I
KAWE
KAWB
KFME
WDSE
KWCM
KTCA
KTCI
WHWC
KESD
KSMQ
49N
48N
47N
46N
45N
44N
97W
96W
95W
94W
93W
92W
91W
90W
0
50
100
150
200
250
300
350
400 MILES
Signal Coverage
Grade A
Area: 40800. sq mi
Population: 3060000
Households: 1092000
Grade B
Area: 67300. sq mi
Population: 3745000
Households: 1328000

MISSISSIPPI

Basic Statistics

Total State Population:	2,521,000
Total Population Receiving Public TV Signal:	2,510,000 (100%)
Total Population in Uncovered Areas:	11

Public Television Stations in State

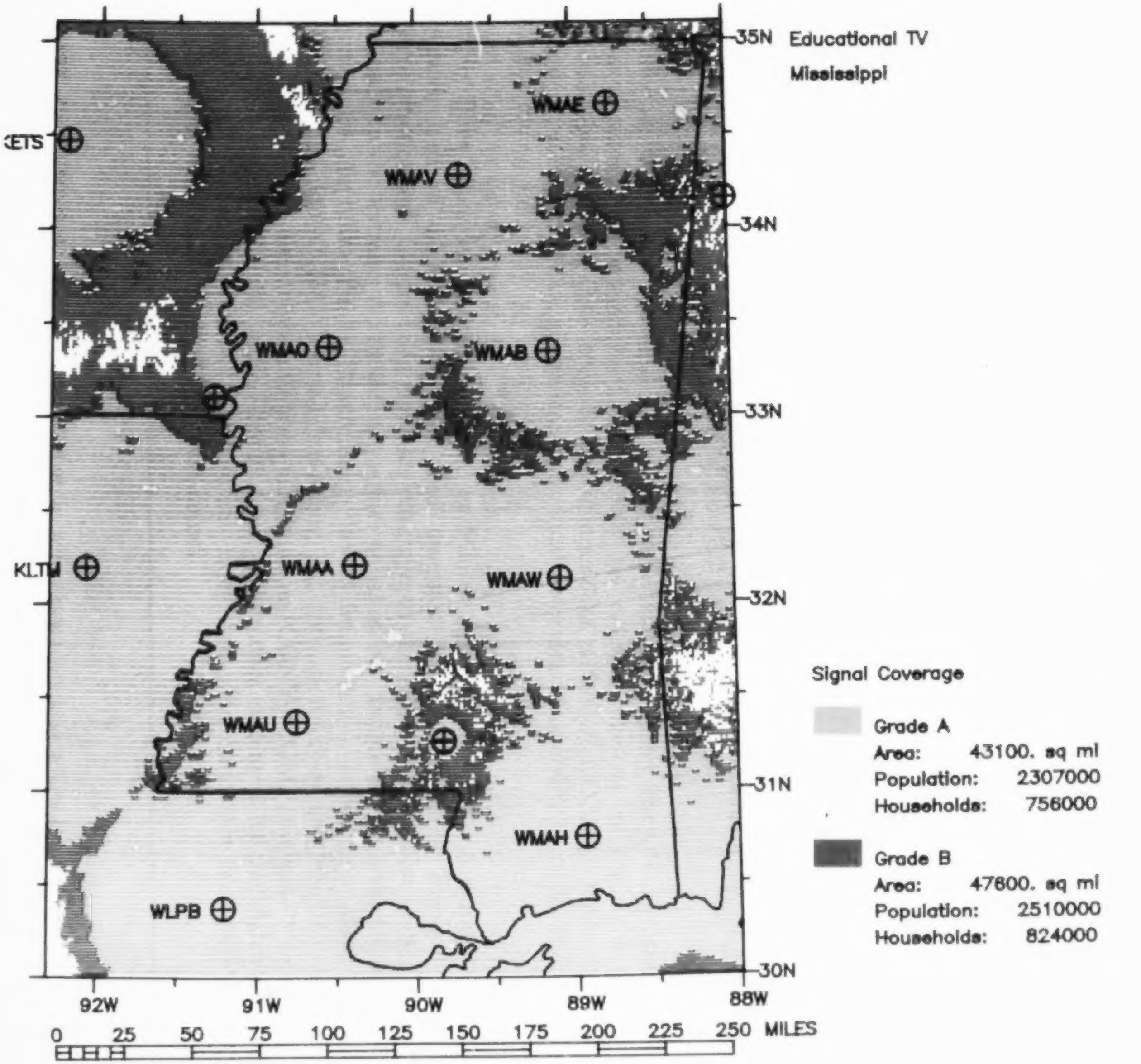
Community	Call Letters
Biloxi	WMAH-TV
Booneville	WMAE-TV
Bude	WMAU-TV
Greenwood	WMAO-TV
Jackson	WMAA-TV
Meridian	WMAW-TV
Miss. State	WMAB-TV
Oxford	WMAV-TV

General Comments

Mississippi public television was developed in accordance with a comprehensive plan designed to maximize coverage within the state and to provide all residents the opportunity to receive at least one over-the-air public television signal. To accomplish this goal, the Mississippi Authority for Educational Television operates a network consisting of a flagship station in Jackson, seven repeater stations, and one television translator; the latter is in Columbia. The state produces programming at its Jackson production facilities.

Uncovered Areas

Mississippi is almost entirely covered by the public television network signals.



Educational TV
Mississippi

Signal Coverage

▨ Grade A
Area: 43100. sq mi
Population: 2307000
Households: 756000

■ Grade B
Area: 47800. sq mi
Population: 2510000
Households: 824000

35N
34N
33N
32N
31N
30N
92W
91W
90W
89W
88W
0
25
50
75
100
125
150
175
200
225
250
MILES
KETS
KLTM
WMAE
WMAV
WMAO
WMAB
WMAA
WMAW
WMAU
WMAH
WLPB

MISSOURI

Basic Statistics

Total State Population:	4,917,000
Total Population Receiving Public TV Signal:	3,908,000 (79%)
Total Population in Uncovered Areas:	1,009,000

Public Television Stations in State

Community	Call Letters
Joplin	KOZJ-TV
Kansas City	KCPT-TV
Springfield	KOZK-TV
St. Louis	KETC-TV
Warrensburg	KMOS-TV

General Comments

Virtually all the heavily populated areas of Missouri receive an over-the-air public television signal. (An exception, which will be discussed below, is the Jefferson City/Columbia region.) The stations are independent, although KOZJ in Joplin is a satellite repeater station -- albeit one with local origination capability -- of KOZK in Springfield.

Stations from other states do play a role in Missouri public television. A channel 24 translator located in Falls City, NE, and operated by the Nebraska Educational Telecommunications Commission provides coverage to the extreme northwest corner of Missouri. In the extreme northeast, a channel 44 translator located in Keokuk, IA, and operated by the Iowa Public Broadcasting Board broadcasts a signal into Missouri. Further south, WQEC-TV, located in Quincy, IL, and operated by the West Central Illinois Educational Telecommunications Corporation (CONVOCOM) projects its signal well into Missouri. In the south, signals from transmitters operated by the Arkansas Educational Television Network Commission carry into Missouri; this is especially significant in Missouri's extreme southeast corner.

Uncovered Areas

With the sole exception of the Jefferson City/Columbia region, the areas of Missouri not covered are rural and very sparsely populated. In addition, it is apparent that almost all the major communities have cable television systems carrying a public television channel. Moreover, many people living outside these communities have installed satellite receive dish antennas, which gives them access to public television signals. Most officials of the public television stations in Missouri, therefore, think that it would be very difficult on economic grounds to make a strong case for further construction to extend their signals.

The unserved areas of Missouri may be divided into four regions.

Region I

Region I is the north central area, extending to a point just north of Columbia. Here the general pattern of sparse population, cabled major communities, and widespread usage of satellite dish antennas applies. It is by and large an area of large farms and farming communities. We estimate that about 275,000 persons may live in this region. The public broadcasters canvassed for this study did not believe that any public television station could easily justify the expenditures for signal-extension facilities here.

The two major communities due north of the KCPT contours illustrate the situation in this unserved region of Missouri. St. Joseph receives a relatively weak over-the-air signal from KCPT. The St. Joseph cable television system, however, does carry KCPT. The other major community to the north, Maryville, also has KCPT on its cable system.

Region II

Region II is the Columbia-Jefferson City area. This is set off from the other unserved regions because some Missouri public broadcasters have suggested that here the concentration of population might justify the construction of a major satellite repeater station. Both cities, however, have cable television systems that carry public television signals. Also, it seems to be assumed that even this region would not be able to support a truly independent full-service station. Any station constructed would have to be the offshoot of an already-established entity.

Defining this region in broad geographical terms, approximately 325,000 to 350,000 persons may reside here.

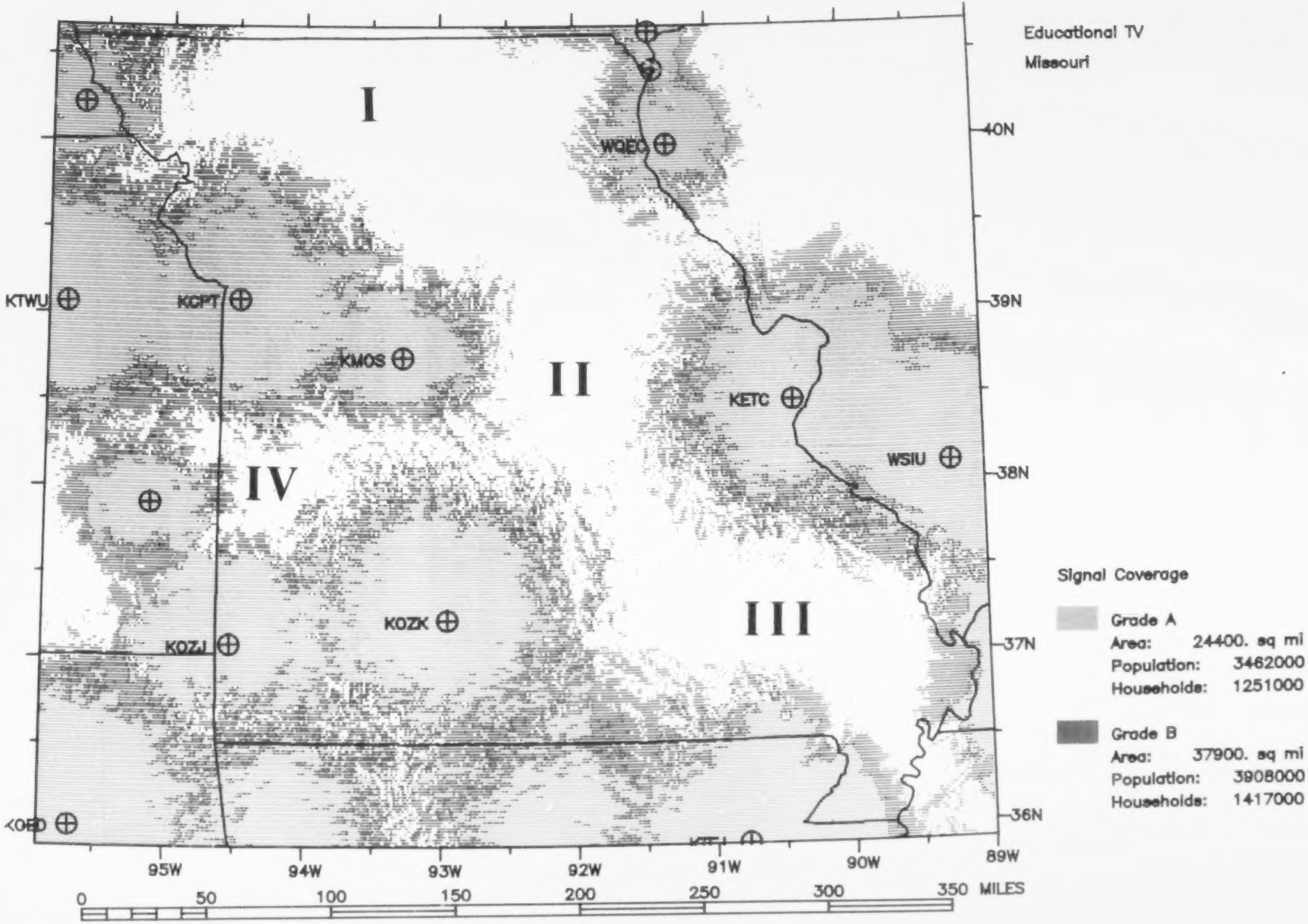
WMOS reports that the very edge of its Grade B contour passes through the middle of Columbia, but concedes that, in part because of audio interference difficulties, the city probably does not receive a very reliable signal. WMOS is considering raising its antenna height in order to be able to broadcast a stronger signal to both Columbia and Jefferson City.

Region III

Region III is the vast area of woodlands in Missouri's southeast quadrant. Most of the Mark Twain National Forest is to be found here. Again, the "general pattern" referred to in our discussion of unserved Region I applies. (Carter County, for example, has just under 5,500 residents.) One public television station staff member has noticed the prevalence of satellite receive dish antennas erected by residents outside the communities. Slightly over 300,000 people may live in this region.

Region IV

Region IV is in the far western part of Missouri, toward the south. It consists of Vernon and Bates Counties, which have a total population of just over 35,000 people. The relatively small size of this particular "white area" suggests that a translator could cover the bulk of it. At the moment, KCPT reports that its signal is indeed marginal in this region. Its signal, however, can be received with special antennas in the hilly region just north of Ft. Scott, KS. The area in question lies immediately to the west of this Missouri "white area" and probably lies within the contours of the KTWU-TV (Topeka) translator in Iola, KS.



Educational TV
Missouri

I
II
III
IV
WQEC
KTWU
KCPT
KMOS
KETC
WSIU
KOZK
KOZJ
KOED
40N
39N
38N
37N
36N
95W
94W
93W
92W
91W
90W
89W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Grade A
Area: 24400. sq mi
Population: 3462000
Households: 1251000
Grade B
Area: 37900. sq mi
Population: 3908000
Households: 1417000

MONTANA

Basic Statistics

Total State Population:	787,000
Total Population Receiving Public TV Signal:	172,000 (22%)
Total Population in Uncovered Areas:	615,000

Public Television Stations in State

Community	Call Letters
Bozeman	KUSM-TV

General Comments

Montana is essentially two states. Each poses distinct problems for the broadcast systems planner. The eastern two-thirds of the state consists of extremely spacious plains, with few major population centers. The vast distances separating the few well-populated locations constitute barriers to public radio extension. Moreover, the sparse population heightens the economic risk in establishing public television entities.

Mountains and expansive areas of national forests dominate the western third of Montana, although most of the state's major communities are to be found there. Such rugged terrain brings its own formidable television extension problems.

Because of these considerations, Montana has used microwave to provide cable television systems with public television service, usually from KUED-TV, Salt Lake City.

Uncovered Areas

Only 22 percent of Montana's population receives an over-the-air public television signal. This is the lowest state coverage percentage in this study's calculations. As noted above, rugged terrain and a widely dispersed, low-density population are the primary reasons for the low coverage statistics.

Public television signals, however, are available from other than the usual over-the-air sources and steps are being taken to increase signal availability. Although this study did not perform an in-depth review of the cable television situation in Montana, a surface look allowed us to estimate that, counting cable television offerings, the majority of Montana residents most likely have access to public television services. In addition, approximately 25 percent of the unserved communities, which also have no cable TV systems, are projected to receive a low power television service from the Rural Television System (RTS). The RTS, which operates from Carson City, Nevada, is explained in more detail in the chapter analyzing public television coverage. Also, KUSM-TV, Bozeman, has inserted its signal into the Salt Lake City microwave feed mentioned above, thus providing an in-state public television service to recipients.

Region I

Beaverhead National Forest covers most of Beaverhead and Madison counties. Butte, one of the largest cities in the state, is found in a third county, Silver Bow. Butte receives public television service via its cable television system. The remaining unserved communities without cable are included in the RTS projections.

Region II

The Missoula area and the Bitterroot Valley are served by a combination of RTS-affiliated low-power television stations and microwave-fed cable services. All significant population centers receive some type of public television service.

Region III

This area is presently served by an RTS-affiliated station on the Flathead Reservation. Kalispell, another major city in the state, is served by microwave-fed cable. The Blackfoot Reservation has extensive translator service along the Canadian border. The balance of this region is covered by the Kootenai and Flathead National Forests and Glacier National Park.

Region IV

The northern tier of the state from Toole to Sheridan Counties is presently unserved by any public broadcast service, either television or radio. Although PTFP and a number of local Indian and educational institutions have made attempts to provide service, the area remains uncovered. The region's problems are associated with the vast land area, low population and limited institutional support for public broadcasting.

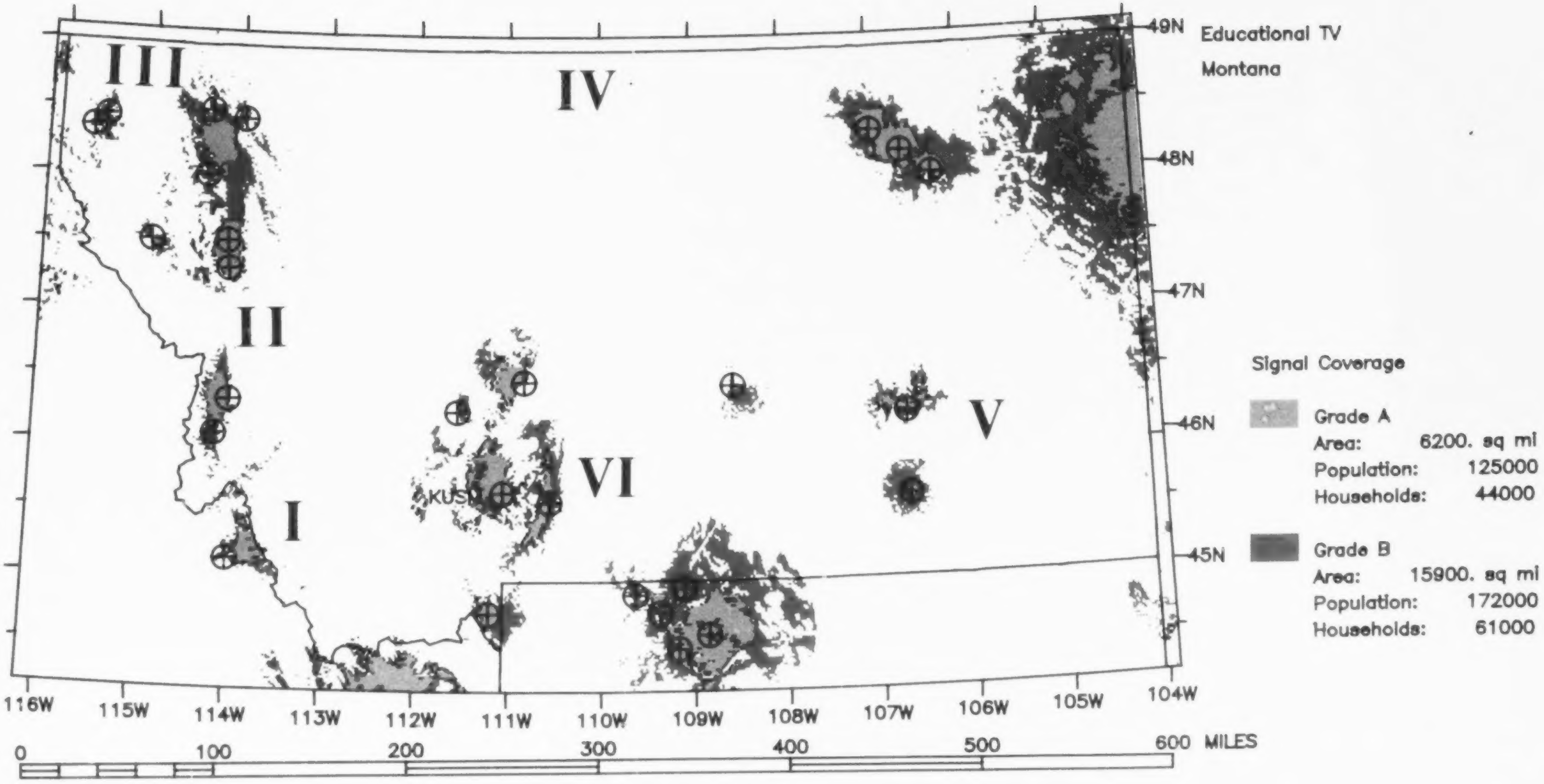
Region V

The southeastern corner of the state has begun to develop public television service through RTS-affiliated low-power stations. Those communities outside of the Interstate

Rte-94 corridor do not seem to have sufficient population concentration to support cable service or to support the operating expenses of an RTS station.

Region VI

The land area between Billings and Bozeman is in the process of developing various community-based translator or low-power television services.



Educational TV

Montana

III
IV
II
I
VI
V
KUSM
49N
48N
47N
46N
45N
116W
115W
114W
113W
112W
111W
110W
109W
108W
107W
106W
105W
104W
0
100
200
300
400
500
600 MILES
Signal Coverage
Grade A
Area: 6200. sq mi
Population: 125000
Households: 44000
Grade B
Area: 15900. sq mi
Population: 172000
Households: 61000

NEBRASKA

Basic Statistics

Total State Population:	1,570,000
Total Population Receiving Public TV Signal:	1,536,000 (98%)
Total Population in Uncovered Areas:	34,000

Public Television Stations in State

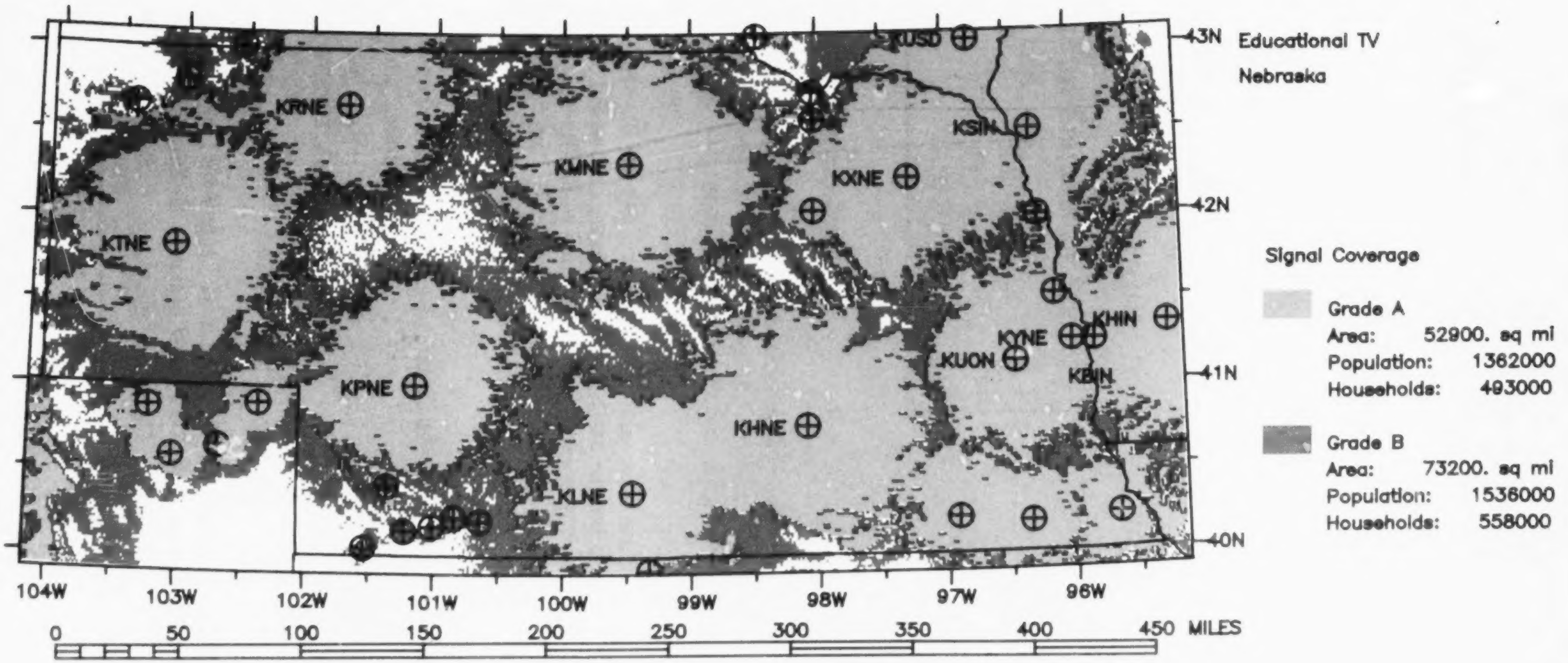
Community	Call Letters
Alliance	KTNE-TV
Bassett	KMNE-TV
Hastings	KHNE-TV
Lexington	KLNE-TV
Lincoln	KUON-TV
Merriman	KRNE-TV
Norfolk	KXNE-TV
North Platte	KPNE-TV
Omaha	KYNE-TV

General Comments

For all practical purposes, Nebraska is fully covered by public television signals. This is achieved by a statewide system administered by the Nebraska Educational Telecommunications Commission, a state agency with headquarters in Lincoln. The system includes the nine full-power stations listed above and 16 television translators.

Uncovered Areas

The accompanying coverage map shows that very few areas may receive a signal that is less than fully reliable. These areas tend to be extremely sparsely populated. To illustrate, one such area is the extreme northwest corner of the state, which is the site of the Oglala National Grasslands.


Educational TV
Nebraska
Signal Coverage
Grade A
Area: 52900. sq mi
Population: 1362000
Households: 493000
Grade B
Area: 73200. sq mi
Population: 1536000
Households: 558000
KUSD
KRNE
KMNE
KSIN
KXNE
KTNE
KHIN
KYNE
KUON
KBIN
KPNE
KHNE
KLNE
43N
42N
41N
40N
104W
103W
102W
101W
100W
99W
98W
97W
96W
0
50
100
150
200
250
300
350
400
450 MILES

NEVADA

Basic Statistics

Total State Population:	800,000
Total Population Receiving Public TV Signal:	712,000 (89%)
Total Population in Uncovered Areas:	88,000

Public Television Stations in State

Community	Call Letters
Las Vegas	KLVX-TV
Reno	KNPB-TV

General Comments

Like most of the Rocky Mountain states, Nevada has a few major metropolitan areas, in which a majority of the population resides. In the case of Nevada, the major population clusters are Reno/Carson City, Las Vegas and the corridor along Interstate Rte-80, which crosses the northern part of the state.

The two major metropolitan areas are covered by full-service public television stations, as noted in the block above. The smaller towns and cities in the state are served either by translators of the larger stations or through affiliation with the Rural Television System, Inc., which has its headquarters in Carson City. This RTS system, involving remotely controlled low-power public television stations, is discussed in the chapter analyzing public television coverage.

Rural areas which are too small to support even these systems of public television delivery may be forced to resort to individual home satellite dishes

Uncovered Areas

Region I

This is the area south of Tonapah and north of Las Vegas. It includes Death Valley and the Nellis Air Force Range. Most of the settlements are not large enough to support translators or cable television service.

Region II

This area includes White Pine, Eureka, and Lander Counties and the northern section of Nye County. The only communities in this area with over 300 people are Ely (pop. 4,800) and Tonapah (pop. 1,600). Both are served by RTS-affiliated stations. The rest of the area is mountainous desert with few communities large enough to support translators or cable service.

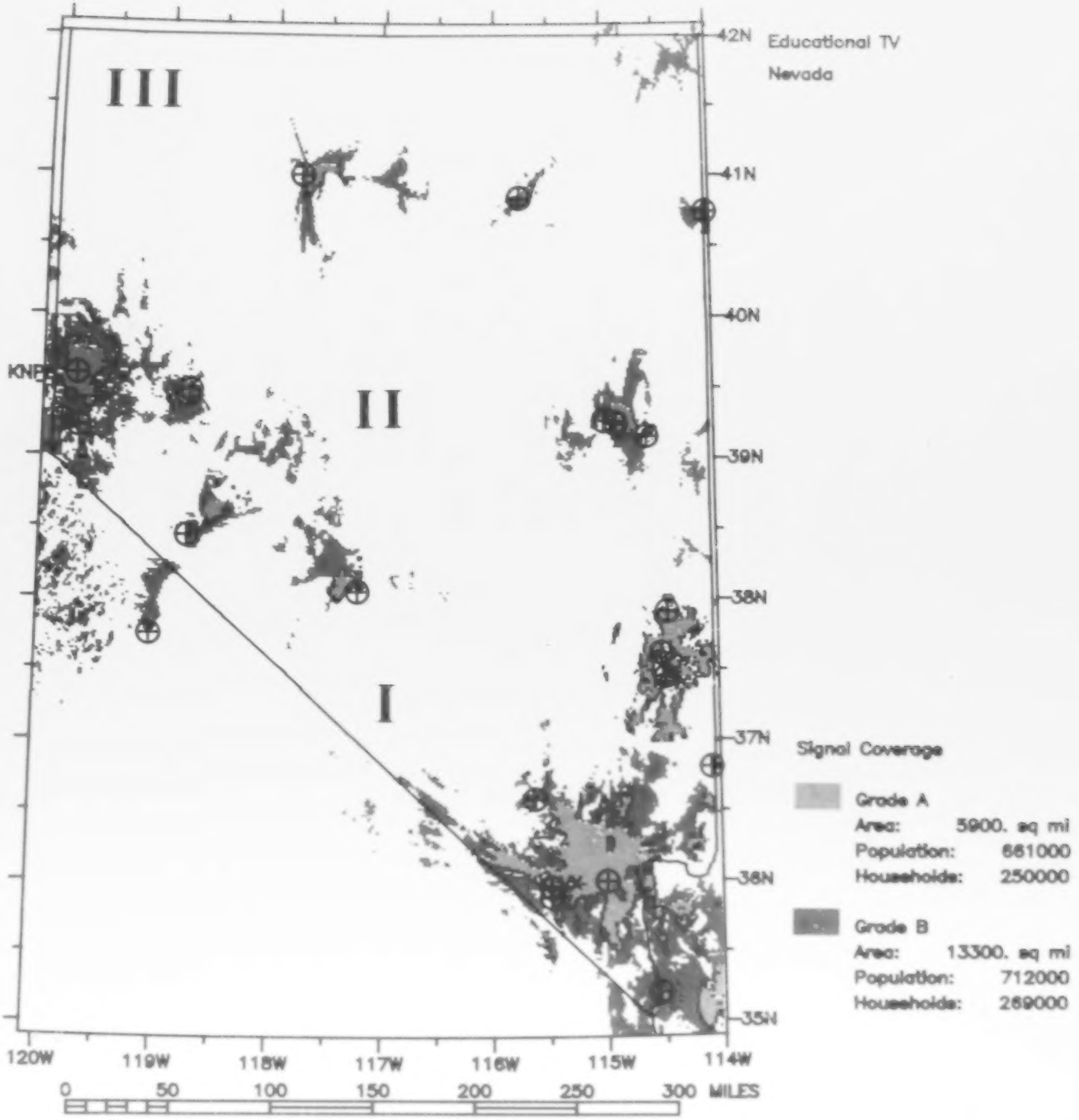
Region III

The northern sections of Washoe and Humboldt Counties include only one community with more than 200 people (Winnemucca pop. 4,140). It is served by an RTS-affiliated low-power station. The balance of the towns in this area are mining sites or settlements with limited services of any kind.

Elko County in the northeast corner of the state is similar to the Humboldt/Washoe area in that its only populated areas are found along I-80. The only community with a substantial population (Elko, pop. 8,758) is already served by an RTS-affiliated low-power station.

Educational TV

Nevada


III
II
I
KNPB
42N
41N
40N
39N
38N
37N
36N
35N
120W
119W
118W
117W
116W
115W
114W
0
50
100
150
200
250
300 MILES
Signal Coverage
Grade A
Area: 5900. sq mi
Population: 681000
Households: 250000
Grade B
Area: 13300. sq mi
Population: 712000
Households: 269000

NEW HAMPSHIRE

Basic Statistics

Total State Population:	921,000
Total Population Receiving Public TV Signal:	856,000 (93%)
Total Population in Uncovered Areas:	65,000

Public Television Stations in State

Community	Call Letters
Durham	WENH-TV
Keene	WEKW-TV
Littleton	WLED-TV

General Comments

The University of New Hampshire provides the only in-state public television signal in New Hampshire, although some parts of the state receive signals from nearby Maine, Vermont and Massachusetts. The University's studios and primary station are in Durham; its repeater stations are located in Keene and Littleton. Transmitters in Hanover and Berlin, while still licensed to the University, are no longer operative due to exorbitant expenses in maintaining electrical power. While no over-the-air New Hampshire signal is received in Hanover and Berlin, public television is available on their cable systems. Both communities have high cable penetration rates.

The northern third of New Hampshire is sparsely populated and mountainous. The topography of the southwest portion of New Hampshire features hills and valleys. The "white space" in the upper central part of the state is the White Mountain National Forest, which has a rugged terrain and is sparsely populated.

Uncovered Areas

Region I

The majority of the "white space" occurs in the unpopulated mountainous region in the northern part of the state, where the terrain prevents reliable signal reception. The provision of public television here would be prohibitively expensive. Economic limitations are the reason that this area has neither cable or commercial television.

Region II

This "white area" in the central part of the state is the White Mountain National Forest and the Winnepesaukee Lake area; the latter is located in a valley.

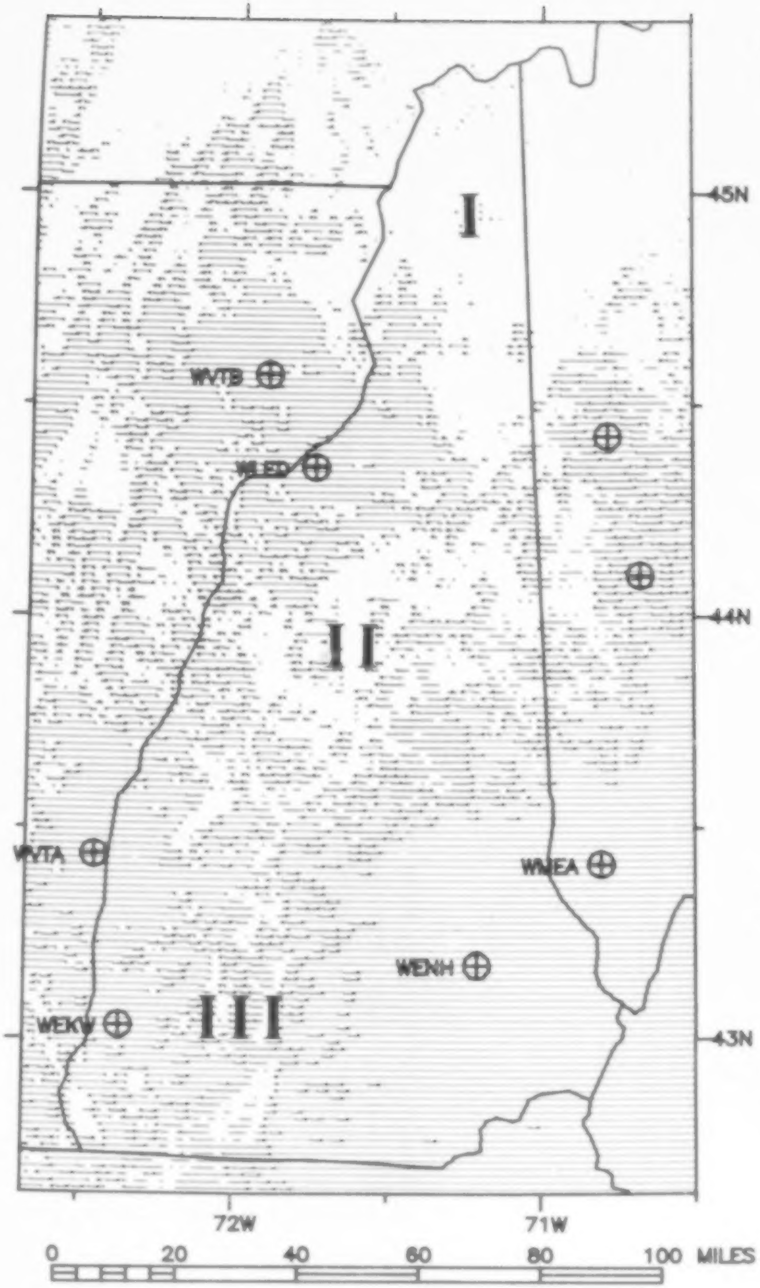
Region III

There is also a spotty area west of Durham and east of Keene. The terrain in these areas is a barrier to television signals. In technical terms, full-power transmitters would therefore provide the best coverage. Translators would be ineffective because of their low power. The cost-effectiveness of establishing full-power transmitters, however, would require evaluation. Experience in other areas of the state indicates that establishing power on mountains and maintaining the equipment can be costly.

Public television is available via cable television in most sizable communities.

Educational TV

New Hampshire


45N
44N
43N
72W
71W
I
II
III
WVTB
WLED
WVTA
WMEA
WENH
WEKW
0
20
40
60
80
100 MILES

Signal Coverage

▨ Grade A

Area:	5800. sq mi
Population:	779000
Households:	271000

▨ Grade B

Area:	7400. sq mi
Population:	856000
Households:	299000

NEW JERSEY

Basic Statistics

Total State Population:	7,365,000
Total Population Receiving Public TV Signal:	7,140,000 (97%)
Total Population in Uncovered Areas:	225,000

Public Television Stations in State

Community	Call Letters
Camden	WNJS-TV
Montclair	WNJM-TV
New Brunswick	WNJB-TV
Trenton	WNJT-TV

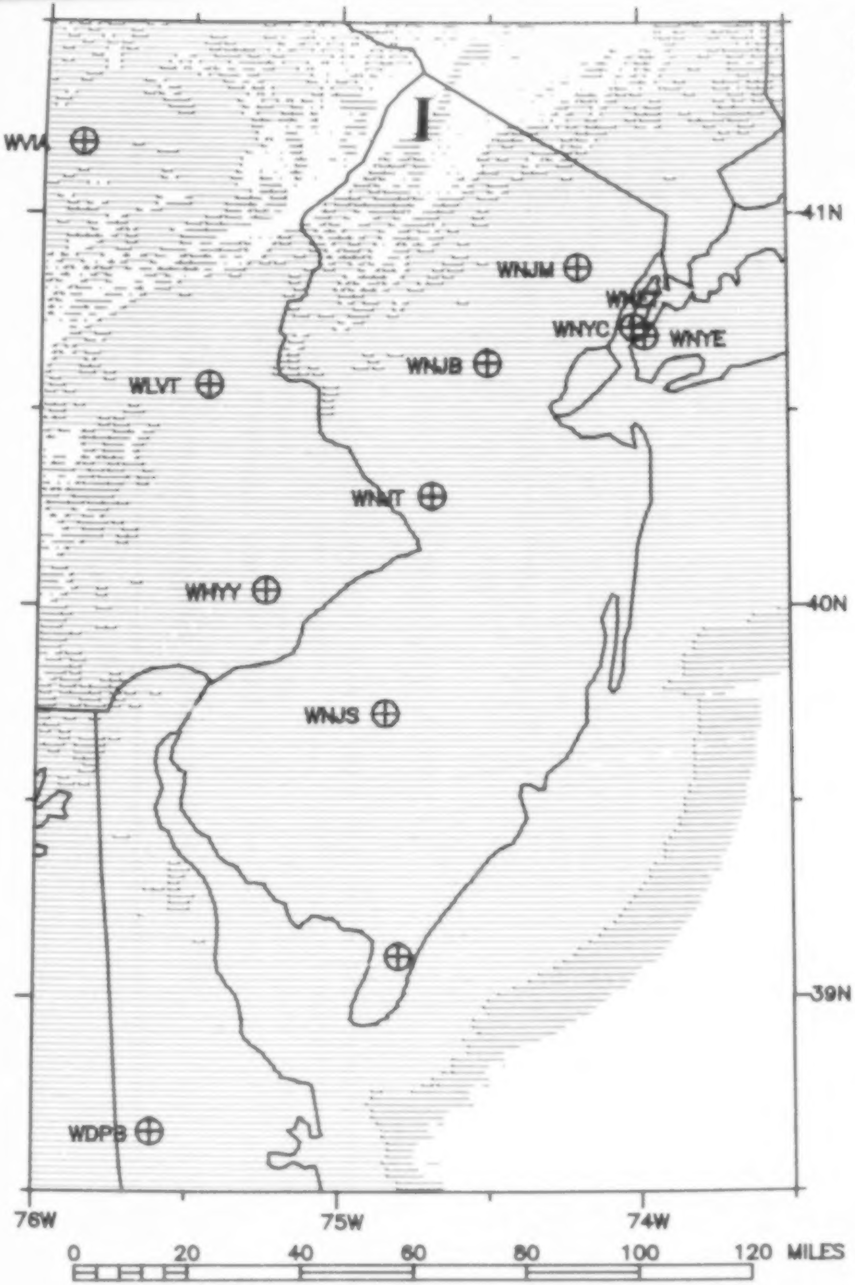
General Comments

The New Jersey Public Broadcasting Authority is the state organization designated to provide oversight of public broadcasting. It is the licensee of four television transmitters and a translator interconnected by microwave. These stations essentially provide coverage to virtually the entire state.

Uncovered Areas

Region I

Because it is mountainous, this sparsely populated region receives no public television signals. The greater part of the region is composed of state forest lands. If individual communities within this area desired public television, translators might be possible.


WVIA
I
41N
WNJM
WNYC
WNYE
WNJB
WLVT
WNJT
WHYY
40N
WNJS
39N
WDPB
76W
75W
74W
0
20
40
60
80
100
120 MILES

Educational TV

New Jersey

Signal Coverage

▨ Grade A

Area:	10000. sq mi
Population:	7050000
Households:	2446000

▨ Grade B

Area:	11300. sq mi
Population:	7140000
Households:	2475000

NEW MEXICO

Basic Statistics

Total State Population:	1,303,000
Total Population Receiving Public TV Signal:	1,129,000 (87%)
Total Population in Uncovered Areas:	174,000

Public Television Stations in State

Community	Call Letters
Albuquerque	KNME-TV
Las Cruces	KRWG-TV
Portales	KENW-TV

General Comments

Thanks in good part to aggressive construction of translators, most of New Mexico is served by an over-the-air public television signal. Each of the New Mexico public television stations is autonomous, there being no formal state system. The stations' coverage extension plans, however, are coordinated through a state public broadcasting commission and are in conformance with a state master plan for the development of public television. The locations and the population density of the unserved areas make it appear highly unlikely that there will be the establishment of any new full-service, "stand-alone" public television stations in New Mexico.

Uncovered Areas

Although New Mexico's terrain is quite diverse, a good deal of the state is mountainous and this accounts for many of the unserved areas. The combination of the rugged landscape and the sparseness of the population in the unserved regions suggests that translators will be the technology through which these areas will eventually be reached.

We have identified seven unserved regions in New Mexico.

Region I

Region I is in the north central part of the state between Farmington/Aztec and Chama/Tierra Amarilla. Although this is primarily the site of the Jicarilla Indian Reservation, it also contains a number of relatively isolated Hispanic villages. The region illustrates perfectly the characteristics of mountainous landscape and sparse population noted above.

Region II

Region II is a stretch of terrain running north from Las Vegas to the Taos/Eagle Nest area. It includes such communities as Sapello, Mora, Tres Ritos and Holman. Much of this stretch is very mountainous and the communities tend to be small. From the perspective of broadcast reception, the communities tend to be located in river bottom areas and are delivered cable television service.

Region III

Region III is more vast, encompassing parts of Colfax, Union, Harding, San Miguel, and Guadalupe Counties. While this area's terrain does contain some mountains, on the whole it is not so rugged as the other regions we have discussed. It is basically a high plains and grasslands region. However, even the plains areas -- south of Clayton and west of Tucumcari -- are very sparsely populated. Harding and Guadalupe Counties together, for example, have slightly under 6,000 residents.

Raton, a sizable community in the mountains of the far north, recently was scheduled to receive translator service from KNME-TV. The site for which the construction permit was approved, however, turned out to be unsatisfactory, and an alternative site became the subject of a contested application. Thus, KNME's plans for translator service to Raton fell through. We have been told that the station intends to continue to look for a suitable site for such a service. Also, the sizable community of Clayton, in the northeast, is covered by the signal from KNME's channel 54 translator in Capulin/Des Moines.

The "white area" that ranges from between Santa Rosa and Portales/Tucumcari to a point just south of Clayton is so sparsely populated that it is not likely to be covered over the air in the near future. Many of the communities in this particular location do not have cable television.

Region IV

Region IV, the far southeast corner of the state, is not well populated, containing only two sizable communities, Eunice and Jal. A New Mexico public broadcaster who is experienced with the problems of this area has estimated that two translators -- one in

Hobbs, to perfect the signal there, and one in Jal -- would cover the area. The signal of KENW, from Portales, is carried on the cable television systems of Hobbs, Eunice, and Jal.

Region V

Region V is bounded by the Huerco, Sacramento, and Guadalupe Mountains, as well as by the Fort Bliss Military Reservation on the west. This is ranching country and has an extremely small population.

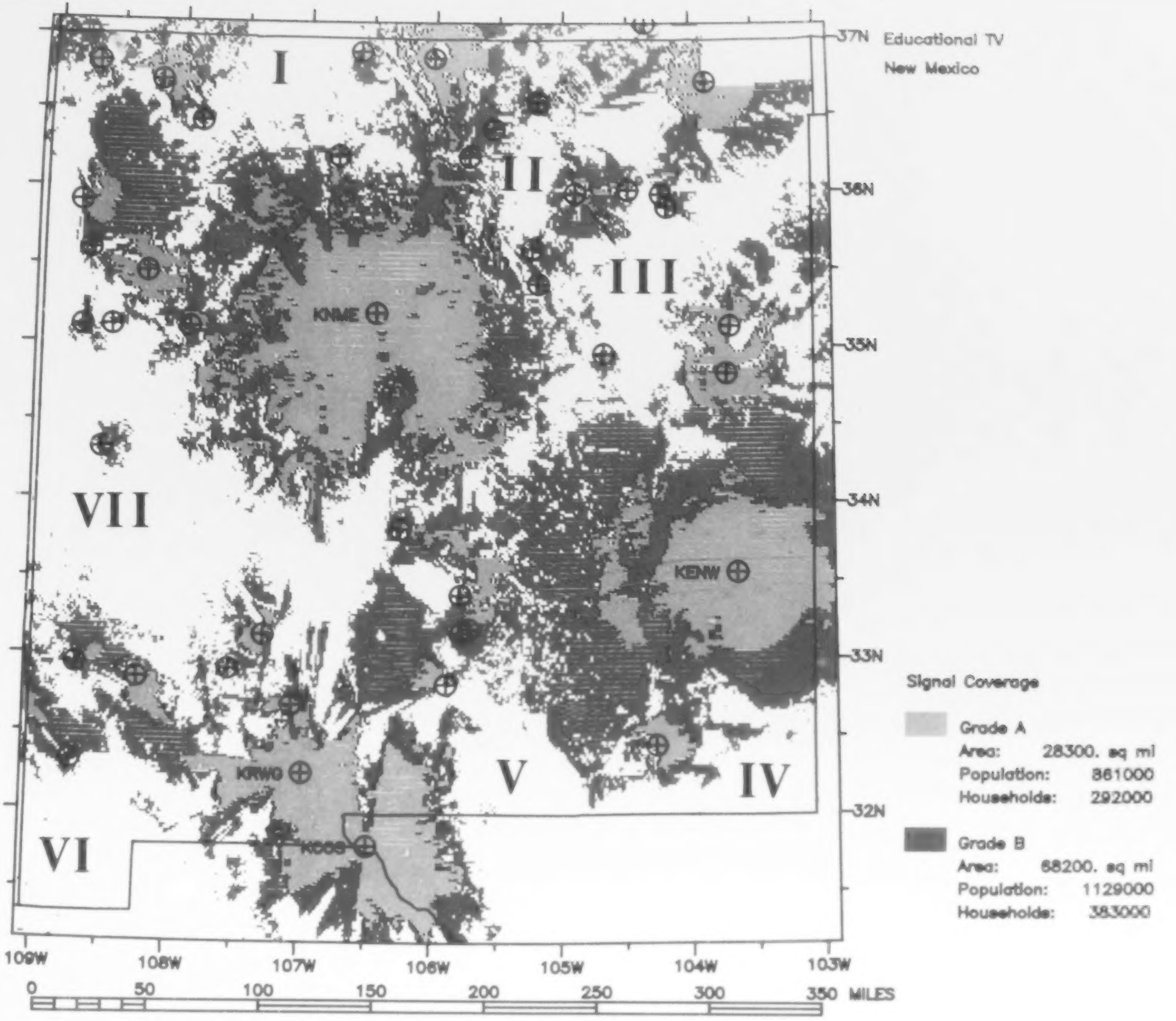
Region VI

Region VI is the extreme southwest corner of the state. It represents the southern portion of Hidalgo County. Within this relatively small area is a national forest and two mountain ranges. Moreover, two other mountain ranges may well act as barriers to the signals from KRWG-TV, channel 22, in Las Cruces and from KRWG's translator in Lordsburg. Hidalgo County has slightly over 6,000 residents but over half live in Lordsburg, which is north of the area being discussed and, as noted, covered by translator service. Certain communities in the "white area" do receive cable television services, which carry a public television signal originating from KUAT-TV, channel 6, in Tucson, Arizona.

Region VII

Region VII is bounded to the west by the New Mexico-Arizona state line, to the south by the northern edges of the contours of KRWG's translators in Cliff-Gila, Silver City, Hillsboro, and Truth or Consequences, to the east by the San Andreas Mountains and the White Sands Missile Range, and to the north by the North Plains. Much of this region is extremely rugged mountain country and has little population. To illustrate this, Catron County has under 3,000 residents. Local public broadcasting experts have suggested that the location within this "white region" most in need of service is the Glenwood/Reserve area and that a series of three translators might accomplish this.

Finally, certain pockets within the areas shown as covered on the accompanying map are, in the view of New Mexico public television officials, not reached by a reliable signal. This is usually due to rugged terrain which prevents signal penetration. Examples cited are Aztec (because of a ridge line blocking the signal from Farmington), Fort Sumner, Abiquiu, Penasco, and Cloudcroft. Presumably, translators would again be the best way to extend reliable coverage to these communities.


Educational TV
New Mexico
Signal Coverage
Grade A
Area: 28300. sq mi
Population: 861000
Households: 292000
Grade B
Area: 68200. sq mi
Population: 1129000
Households: 383000
I
II
III
IV
V
VI
VII
KNME
KENW
KRWG
KCOS
37N
36N
35N
34N
33N
32N
109W
108W
107W
106W
105W
104W
103W
0
50
100
150
200
250
300
350 MILES

NEW YORK

Basic Statistics

Total State Population:	17,558,000
Total Population Receiving Public TV Signal:	16,858,000 (96%)
Total Population in Uncovered Areas:	700,000

Public Television Stations in State

Community	Call Letters
Binghamton	WSKG-TV
Buffalo	WNED-TV
	WNEQ-TV
Garden City	WLIW-TV
New York	WNYC-TV
	WNET-TV
	WNYE-TV
Norwood	WNPI-TV
Plattsburgh	WCFE-TV
Rochester	WXXI-TV
Schenectady	WMHT-TV
Syracuse	WCNY-TV
Watertown	WNPE-TV

General Comments

Public television coverage in New York is provided by a loose network of stations which are community licensees. The New York State Education Department provides administrative oversight and financial and programmatic support to the network.

Major mountain ranges -- the Catskills, Adirondacks and the Appalachians -- present terrain barriers to broadcast signals and account for the majority of unserved populations and unpopulated land areas in the state.

Translators are the primary technology used to extend television signals to the unserved pockets of this state. This is noted especially along the southern tier, where translators frequently disseminate signals to the cable hubs, which in turn serve villages and small communities. The system of translators now in place along the southern tier was constructed approximately 10-15 years ago by the Appalachian Regional Commission for the purpose of providing public television to the region's public schools.

It is noteworthy that the same area which boasts a plethora of public television coverage is virtually unserved by public radio.

Uncovered Areas

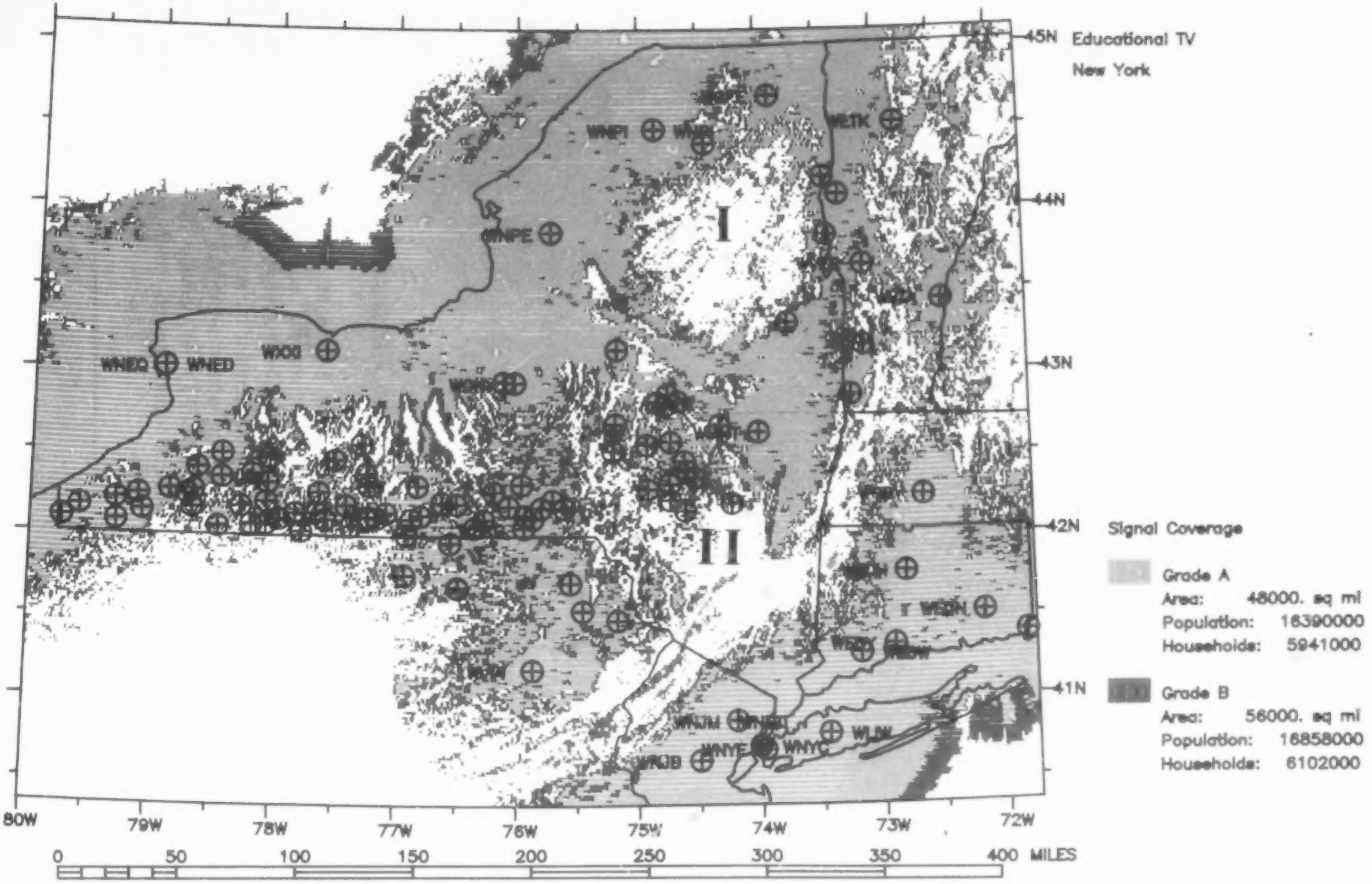
The majority of New York receives a public television signal. However, this is a mountainous state and the uncovered areas are primarily pockets where terrain or power limitations of existing transmission equipment prevents signal penetration or dependable signal coverage.

Region I

The Adirondack Mountains are the major topographical feature of this region. Adirondack Park is situated in these mountains and covers a large area of the region. Construction within the Park is severely restricted by the State Park Service which administers the area. Where restrictions do not apply, repeaters and translators could possibly be employed. However, cost-effectiveness and practicality will have to be studied carefully. Approximately 400,000 people live in this region.

Region II

Although translators provide some service in the Catskills, much of the area is unserved because of the rough terrain. Small stations and translators could be technical possibilities for bringing service to the region's estimated 300,000 residents.



Educational TV

New York

45N
44N
43N
42N
41N
80W
79W
78W
77W
76W
75W
74W
73W
72W
0
50
100
150
200
250
300
350
400 MILES
I
II
WNPI
WETK
WNPE
WXXI
WNEQ
WNED
WSKN
WEDW
WLIW
WNJM
WNYE
WNYC
WNJB
Signal Coverage
Grade A
Area: 48000. sq mi
Population: 16390000
Households: 5941000
Grade B
Area: 56000. sq mi
Population: 16858000
Households: 6102000

NORTH CAROLINA

Basic Statistics

Total State Population:	5,882,000	
Total Population Receiving Public TV Signal:	5,757,000	(98%)
Total Population in Uncovered Areas:	125,000	

Public Television Stations in State

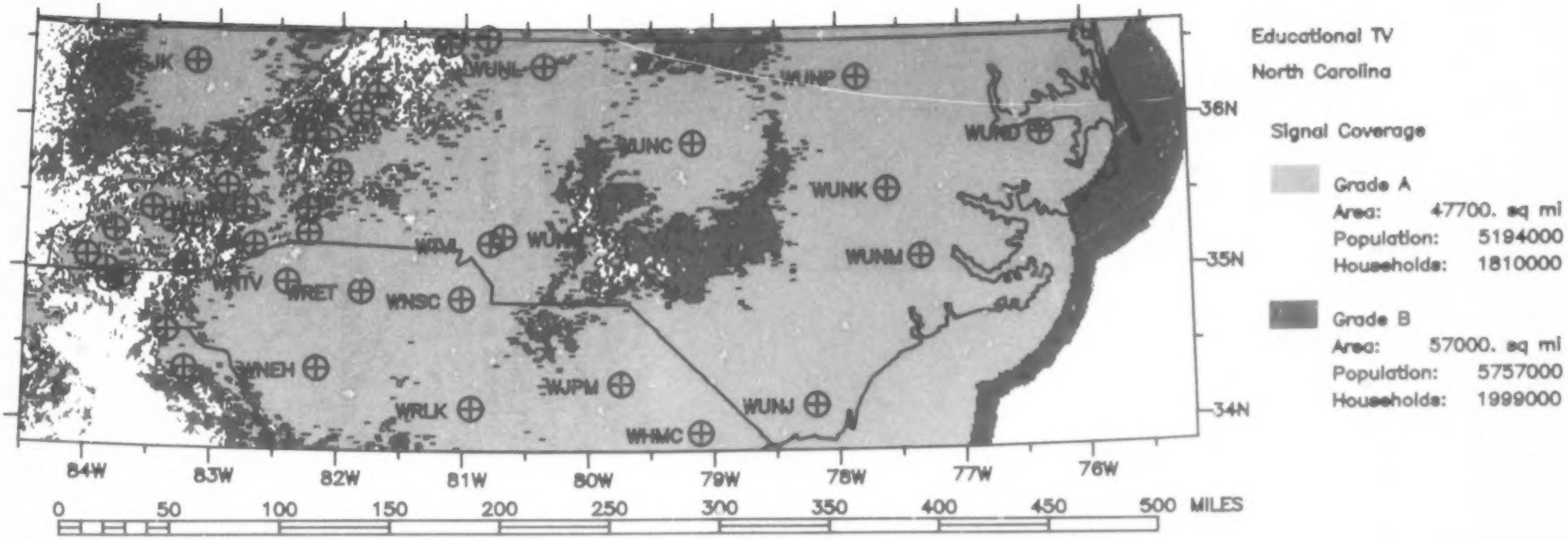
Community	Call Letters
Asheville	WUNF-TV
Chapel Hill	WUNC-TV
Charlotte	WTVI-TV
Columbia	WUND-TV
Concord	WUNG-TV
Greenville	WUNK-TV
Jacksonville	WUNM-TV
Linville	WUNE-TV
Roanoke Rapids	WUNP-TV
Wilmington	WUNJ-TV
Winston-Salem	WUNL-TV

General Comments

The residents of North Carolina receive a public television service from the state-supported network licensed to the University of North Carolina Center for Public Television which has its headquarters in Chapel Hill. The network consists of 11 television stations and approximately 20 television translators that are either in operation or under construction. Public television is also provided by the Charlotte-Mecklenburg Public Broadcasting Authority, licensee of WTVI in Charlotte, which serves residents of the south central part of the state. Several public television signals from adjoining states are also received.

Uncovered Areas

The broadcast signals from the state public television network, the Charlotte station (WTVI) and stations from adjoining states provide public television coverage to virtually the entire state except some mountainous areas along the Tennessee border.


Educational TV
North Carolina
Signal Coverage
Grade A
Area: 47700. sq mi
Population: 5194000
Households: 1810000
Grade B
Area: 57000. sq mi
Population: 5757000
Households: 1999000
WUNL
WUNP
WUND
WUNC
WUNK
WUNM
WUNJ
WHMC
WJPM
WRLK
WNSC
WRET
WNTV
WNEH
36N
35N
34N
84W
83W
82W
81W
80W
79W
78W
77W
76W
0
50
100
150
200
250
300
350
400
450
500 MILES

NORTH DAKOTA

Basic Statistics

Total State Population:	653,000
Total Population Receiving Public TV Signal:	585,000 (90%)
Total Population in Uncovered Areas:	68,000

Public Television Stations in State

Community	Call Letters
Bismarck	KBME-TV
Dickinson	KDSE-TV
Fargo	KFME-TV
Grand Forks	KGFE-TV
Minot	KSRE-TV
Williston	KWSE-TV

General Comments

By far the greater part of North Dakota receives a reliable over-the-air public television signal. This is attributable to the system of stations administered by Prairie Public Broadcasting, Inc. (PPB), which has its headquarters in Fargo. That system comprises one full-service station (KFME in Fargo), five satellite repeater stations, and three translators. In the southeast part of the state, the northern contours of KDSD-TV, channel 16, in Pierpont, SD, help complete the coverage pattern of North Dakota; KDSD is licensed to the South Dakota state public television system.

Uncovered Areas

The accompanying coverage map would suggest that four regions of North Dakota are receiving either no public television signal or an unreliable signal.

Region I

PBB considers Region I, which is Burke County in the northwest, to be covered. Evidently, the few people who live there have long since adapted to a signal that is less than Grade B strength. In this instance, the signal originates from KWSE in Williston.

best copy available

Region II

Region II, which is Bowman County in the extreme southwest, is extremely sparsely populated, being the area known as the "Badlands." It is highly unlikely that any effort will be made to extend a signal there.

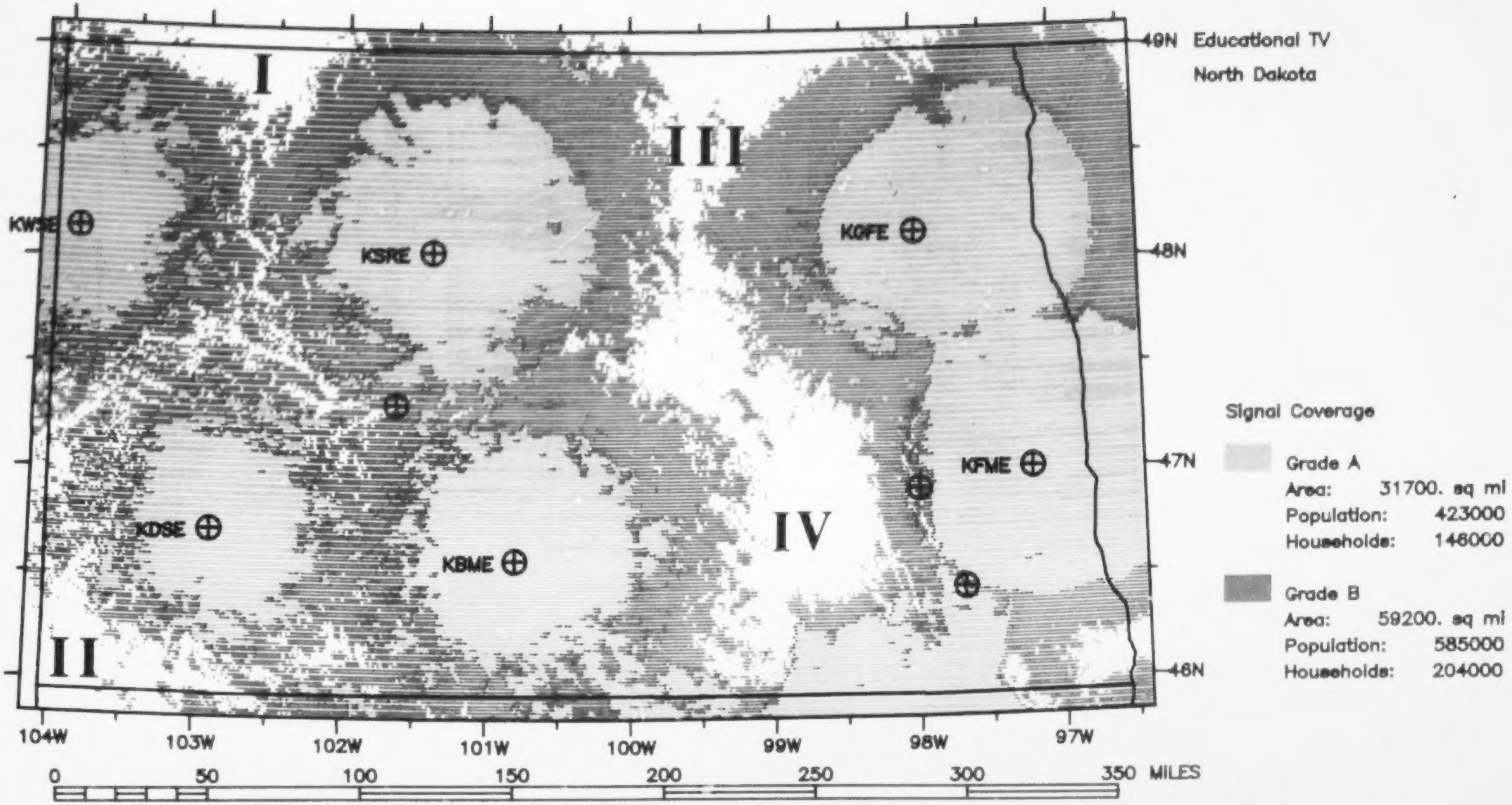
Region III

Region III is the hour-glass shaped unserved area in the north central part of the state, ranging from the Canadian border to the middle of the state near Fessenden. PPB believes that this region is covered by the extremes of the contours from KSRE, Minot and KGFE, Grand Forks. PPB notes that the terrain in this region is somewhat higher than that found immediately to the south and that this factor allows for reliable coverage even beyond the formal Grade B contours of those two stations.

(PPB may be adding a TV translator to an already-covered area around the community of Bottineau, which is just to the west of the "white area" being discussed. According to PPB, a slight interference problem has arisen there involving the signal of KSRE, Minot, which operates on channel 6. The interference situation concerns the signal of public radio station KEYA-FM, which operates from the nearby Turtle Mountain Indian Reservation. A translator would resolve the matter.)

Region IV

Region IV is the unserved area starting at Fessenden and curving south to the South Dakota boundary. This region represents North Dakota's most serious public television coverage problem. The greater part of the region, from Fessenden to the Jamestown area, is the James River valley, the terrain of which is relatively low. PPB believes that a major satellite repeater station located on the high terrain west of the James River and approximately 15 miles south of Jamestown would emit a signal that would cover almost the whole of this "white space," all the way north to Fessenden. Funding for the nonfederal share of a grant project that would activate such a station is pending before the North Dakota Legislative Assembly.


Educational TV
North Dakota
Signal Coverage
Grade A
Area: 31700. sq mi
Population: 423000
Households: 146000
Grade B
Area: 59200. sq mi
Population: 585000
Households: 204000
I
II
III
IV
KWSE
KSRE
KDSE
KBME
KGFE
KFME
49N
48N
47N
46N
104W
103W
102W
101W
100W
99W
98W
97W
0
50
100
150
200
250
300
350 MILES

OHIO

Basic Statistics

Total State Population:	10,798,000
Total Population Receiving Public TV Signal:	10,680,000 (99%)
Total Population in Uncovered Areas:	118,000

Public Television Stations in State

Community	Call Letters
Akron	WEAO-TV
Alliance	WNEO-TV
Athens	WOUB-TV
Bowling Green	WBGU-TV
Cambridge	WOUC-TV
Cincinnati	WCET-TV
Cleveland	WVIZ-TV
Columbus	WOSU-TV
Dayton	WPTD-TV
Oxford	WPTO-TV
Portsmouth	WPBO-TV
Toledo	WGTE-TV

General Comments

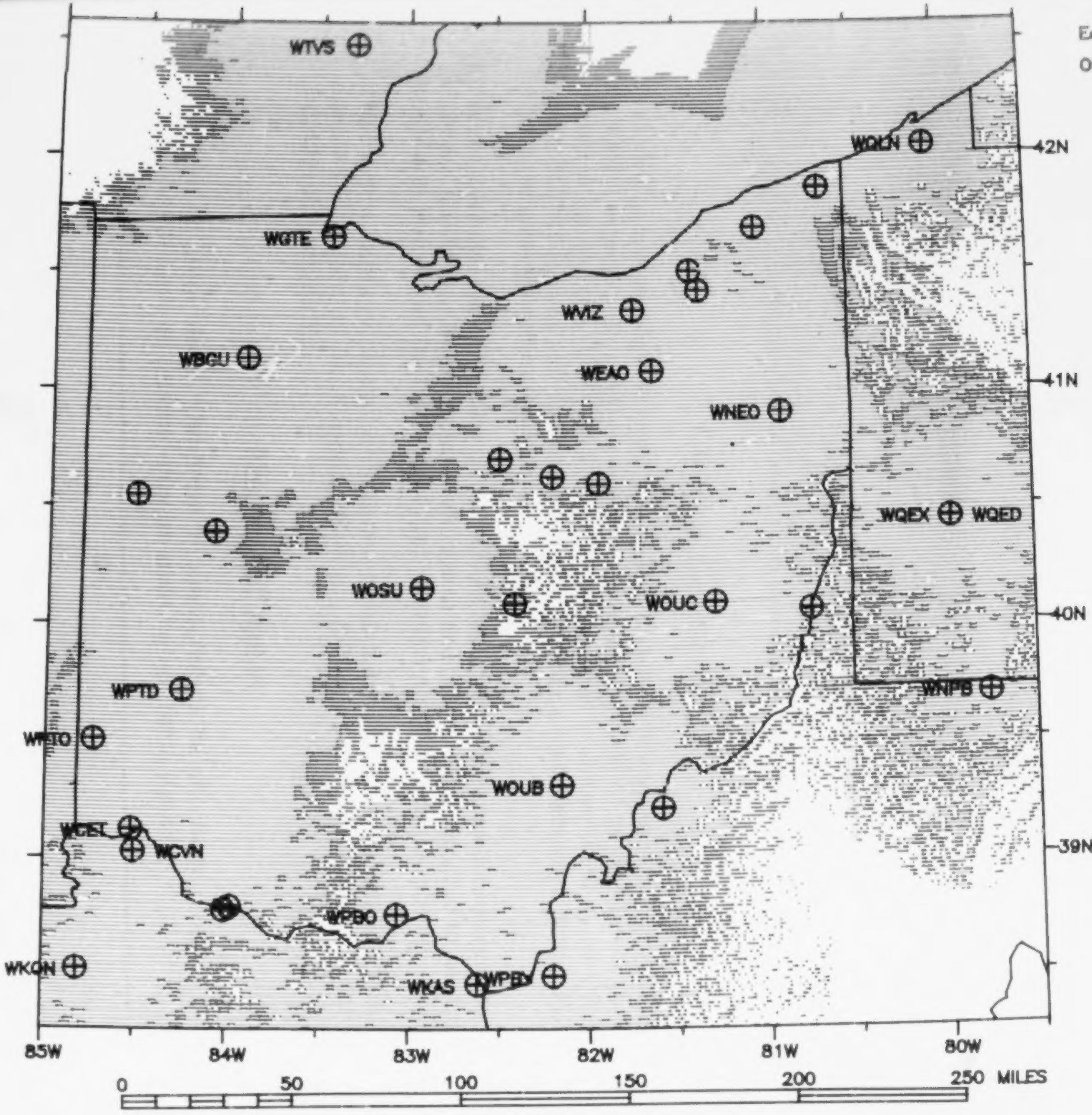
Ohio is fully covered by public television signals. The Ohio Educational Television Network is the coordinating entity for the development of public radio and television in the state.

Uncovered Areas

As noted above, Ohio is essentially covered.

Educational TV

Ohio


WTVS
WGTE
WQLN
WVIZ
WBGU
WEAO
WNEO
WQEX
WQED
WOSU
WOUC
WNPB
WPTD
WPTO
WOUB
WCET
WCVN
WPBO
WKON
WKAS
WPBY
42N
41N
40N
39N
85W
84W
83W
82W
81W
80W
0
50
100
150
200
250 MILES

Signal Coverage

▒ Grade A
Area: 43100. sq mi
Population: 10312000
Households: 3667000

▓ Grade B
Area: 47900. sq mi
Population: 10680000
Households: 3794000

OKLAHOMA

Basic Statistics

Total State Population:	3,025,000
Total Population Receiving Public TV Signal:	2,905,000 (96%)
Total Population in Uncovered Areas:	120,000

Public Television Stations in State

Community	Call Letters
Cheyenne	KWET-TV
Claremore	KXON-TV
Eufaula	KOET-TV
Oklahoma City	KETA-TV
Tulsa	KOED-TV

General Comments

According to a representative of the Oklahoma Educational Television Authority (OETA), the OETA considers the state as having been substantially covered by over-the-air public television signals since 1982. This nearly total coverage is accomplished by an OETA system of four stations and 15 translators. Two stations -- in Oklahoma City and Tulsa -- have program production capability.

Further coverage has been achieved by KXON in Claremore, licensed to Rogers State College. KXON provides alternative telecourses and programming designed to meet the needs and interests of the Native American population of northeast Oklahoma.

The extreme northeast corner of Oklahoma is reached by the signal of public television station KOZJ, channel 26, in Joplin, Missouri. KOZJ is administered by Ozark Public Telecommunications, Inc.

Uncovered Areas

Although, as noted above, Oklahoma is considered to be effectively covered, three relatively small areas of the state may be receiving unreliable signals.

Region I

Region I is the Woodward/Quinlan/Chester/Seiling region. OETA believes that the present signals from its station KWET in Cheyenne and its translators in Buffalo and Alva reach this location. We certainly do not dispute this, but the accompanying contour map would suggest that these signals are not received at a Grade B level of reliability. Also, OETA representatives note that the residents of this area tend to have special antennas to better receive the TV signals from Oklahoma City, thus increasing their ability to receive OETA stations. Moreover, the OETA notes that now pending before the State Legislature is a proposal to increase the power of the translator on channel 58 in Buffalo from 100 w to 1,000 w, a change that would improve the reception in the subject area. Finally, OETA reports that its long-range planning of five to 10 years in the future in the future includes the possibility of a major satellite repeater station in Woodward; this would presumably end whatever signal reliability problems remained in this region.

Region II

Region II is located in southwest Oklahoma bounded by the contours of stations KWET (Cheyenne), KETA (Oklahoma City) and OETA translators in Altus, Frederick and Lawton. In this area are found the Wichita Mountains and the National Wildlife Reserve. The region encompasses parts of Kiowa and Caddo Counties. The population there is extremely sparse. In response to their relative isolation, many of the residents have installed sophisticated reception equipment. As part of its long-range planning, OETA is considering upgrading the status of its Lawton translator. This would improve the reliability of the OETA signal to this region.

Region III

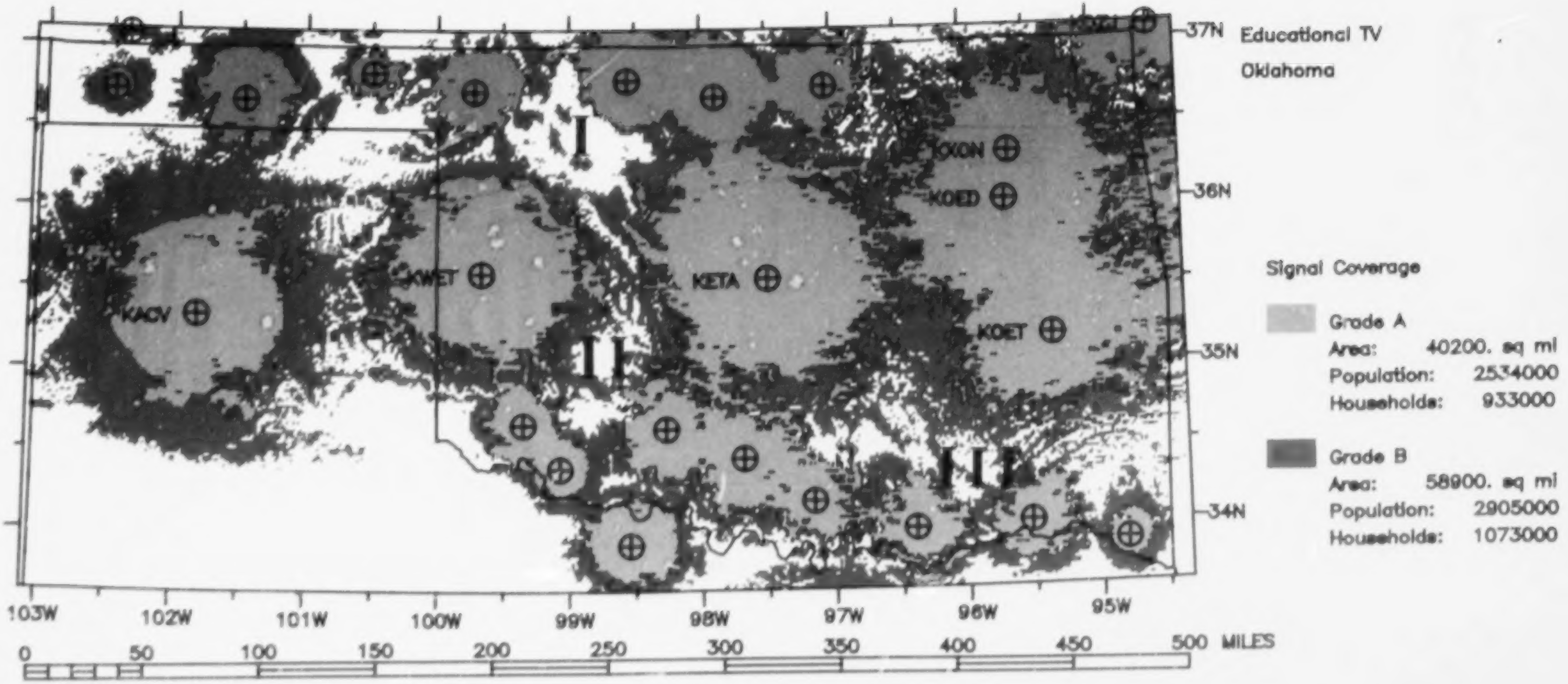
Region III is a relatively narrow area extending east-west from the Arkansas border to a spot just north of OETA's channel 28 translator in Ardmore. This region is very mountainous and sparsely populated. The OETA contends that the state's signal is found on most of the cable systems in the communities there. Also, the OETA has proposed to the State Legislature that it be allowed to increase the power of the channel 63 translator in Idabel from 100 w to 1,000 w. In OETA's long-range planning is the possibility of raising the power of the channel 15 translator in Hugo to something closer to full power.

Additional Coverage Problems

The OETA is concerned about complaints it has received about unreliable state system coverage in two areas:

- The Miami region, in the extreme northeast. This location is reached by the signal from Joplin, MO.
- North Johnston and southern Ponatoc Counties, in south central Oklahoma.

OETA plans to take signal strength measurements in these places. If conditions appear to warrant it, the Authority will consider activating translators to meet the need.


Educational TV
Oklahoma
Signal Coverage
Grade A
Area: 40200. sq mi
Population: 2534000
Households: 933000
Grade B
Area: 58900. sq mi
Population: 2905000
Households: 1073000
KACV
KWET
KETA
KOET
KOED
KXON
I
II
III
37N
36N
35N
34N
103W
102W
101W
100W
99W
98W
97W
96W
95W
0
50
100
150
200
250
300
350
400
450
500 MILES

OREGON

Basic Statistics

Total State Population:	2,633,000
Total Population Receiving Public TV Signal:	2,441,000 (93%)
Total Population in Uncovered Areas:	192,000

Public Television Stations in State

Community	Call Letters
Bend	KOAB-TV
Corvallis	KOAC-TV
Klamath Falls	KFTS-TV
La Grande	KTVR-TV
Medford	KSYS-TV
Portland	KOAP-TV

General Comments

The Cascade Mountain range, extending from the Washington border to the California border, divides Oregon into two parts. The western portion, with a majority of the state's population, is served by public television station KOAP, Portland, its repeater station KOAC in Corvallis, and KSYS, Medford. Over-the-air television service from these stations to communities on the Pacific coast is blocked by the Coast Range of mountains. Television service to coastal communities is delivered by translator and cable.

Public television east of the Cascade Mountains is delivered via repeater stations in Bend, La Grande, Klamath Falls and via translators.

Five of the six licensed stations in Oregon operate on VHF channels, with only KFTS, Klamath Falls, operating on a UHF channel.

Public television in Oregon is primarily provided by Oregon Public Broadcasting (OPB), the operating unit of the Oregon Commission on Public Broadcasting. Service to southwest Oregon is provided by the Southern Oregon Public Television, Inc., Medford.

OPB operates main production and transmission facilities in Portland, with repeater stations in Bend, Corvallis and La Grande. OPB also operates a statewide microwave system which extends public television service throughout the state. This microwave system feeds some 22 translators located along the Oregon coast, Columbia River valley, and in eastern Oregon. OPB was awarded a PTFP grant in 1988 to assist it in constructing an additional repeater station in Eugene.

The Southern Oregon Public Television, Inc. operates a station in Medford and a series of 11 translators extending public television service in southwest Oregon near the California border. The station also operates a repeater station in Klamath Falls.

Uncovered Areas

We have identified seven major unserved regions in Oregon. Of these, we estimate that Regions III, IV and VII have, respectively, approximately 15, 25, and 30 percent of the state's unserved population.

Region I

The region of northeast Oregon consists primarily of national forest, Eagle Cap Wilderness Area and the Hell's Canyon National Recreational Area. This area has few population centers. OPB has plans to provide translator service translator to Halfway and Richland in Baker County.

Region II

This region between John Day and Baker also consists primarily of national forest. OPB has plans to provide translator service to Prairie City, Hereford and Bridgeport.

Region III

Harney and Malhuer Counties in southeast Oregon are vast areas with extremely low population. The major population centers in these counties, Burns in Harney County and Ontario in Malhuer County, have OPB translator service. OPB has no plans to extend service in this area.

Region IV

The area south of Bend consists primarily of national forest, with the Cascade Mountains to the west. OPB plans to increase the power of KOAB, Bend, which will improve reception in this area. Several communities, including those in the Christmas Valley, have locally operated translators which may not be shown on the map.

Region V

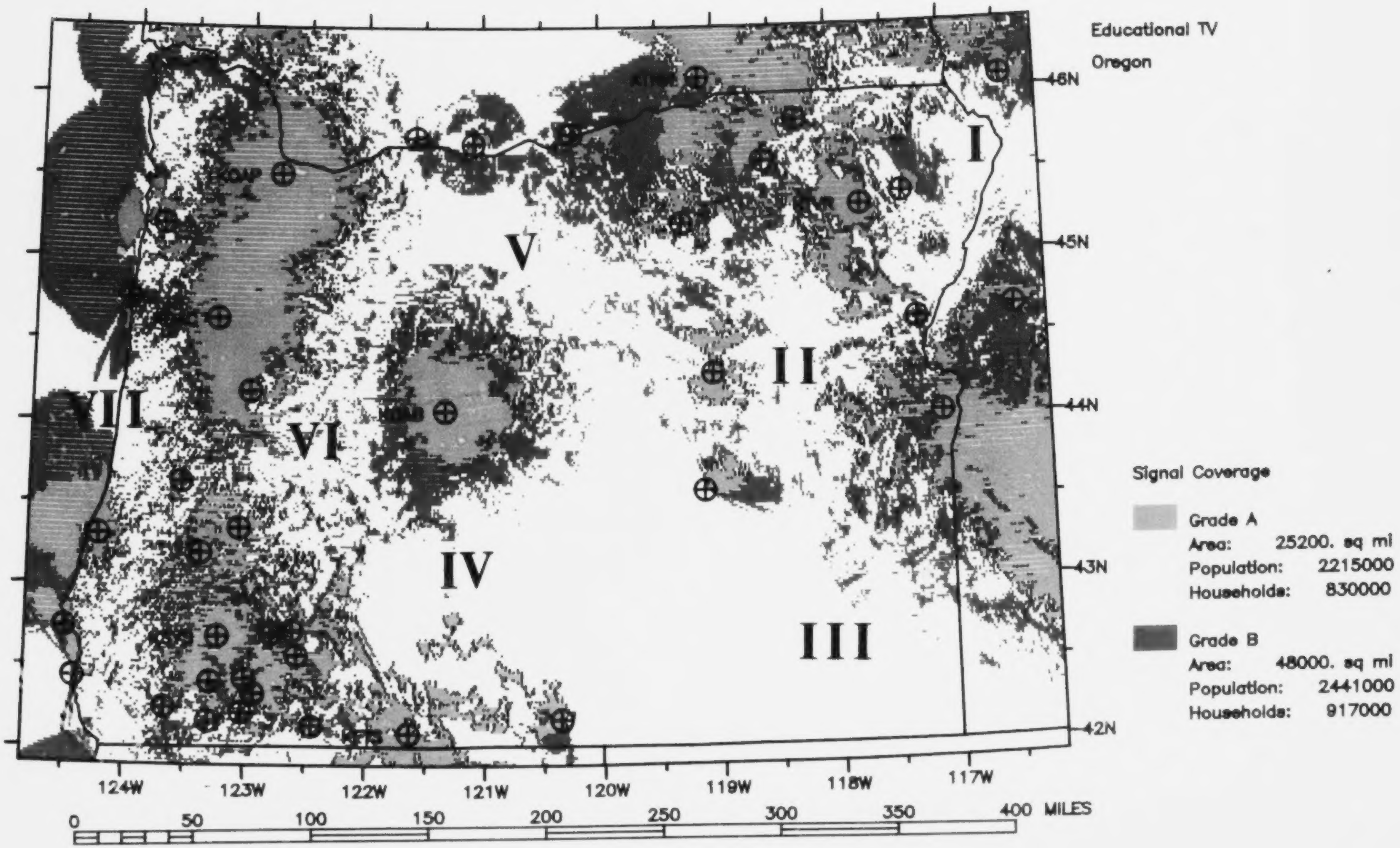
The area to the north and east of Bend have some locally owned translators not shown on the map, including Tygh Valley and Willowdale. The proposed power increase of KOAB, Bend, will also improve reception in this area.

Region VI

This area of national forest is the high ridge of the Cascade Mountains and is national forest stretching from the Columbia River to the California border.

Region VII

Communities along the Oregon Coast are cut off from public television service by the Coast Range of mountains. OPB is reviewing those communities without over-the-air, translator or cable service for potential future translator service.

Educational TV
Oregon
Signal Coverage
Grade A
Area: 25200. sq mi
Population: 2215000
Households: 830000
Grade B
Area: 48000. sq mi
Population: 2441000
Households: 917000
46N
45N
44N
43N
42N
124W
123W
122W
121W
120W
119W
118W
117W
0
50
100
150
200
250
300
350
400 MILES
I
II
III
IV
V
VI
VII
KOAP
KOAB

PENNSYLVANIA

Basic Statistics

Total State Population:	11,864,000
Total Population Receiving Public TV Signal:	10,891,000 (92%)
Total Population in Uncovered Areas:	973,000

Public Television Stations in State

Community	Call Letters
Allentown	WLVT-TV
Clearfield	WPSX-TV
Erie	WQLN-TV
Harrisburg	WITF-TV
Philadelphia	WHYY-TV
Pittsburgh	WQED-TV WQEX-TV
Scranton	WVIA-TV

General Comments

The majority of public television stations in Pennsylvania are licensed to community groups. One is a university licensee. However, all are associated with the Pennsylvania Public Television Network (PPTN). PPTN is the state agency which supports existing public radio and television stations and is responsible for developing a state plan for public broadcasting service. In 1985, NTIA provided funds to PPTN for a comprehensive study of all uncovered areas.

Mountainous topography throughout the state is the major impediment to the propagation of broadcast signals. Although transmitters are purposely placed on high peaks, the population centers in the "white areas" tend to be in the valleys which are shadowed by the steep mountains. In some areas, translators have been used successfully to extend service.

Uncovered Areas

All designated regions are unserved because of the steep mountains.

Region I

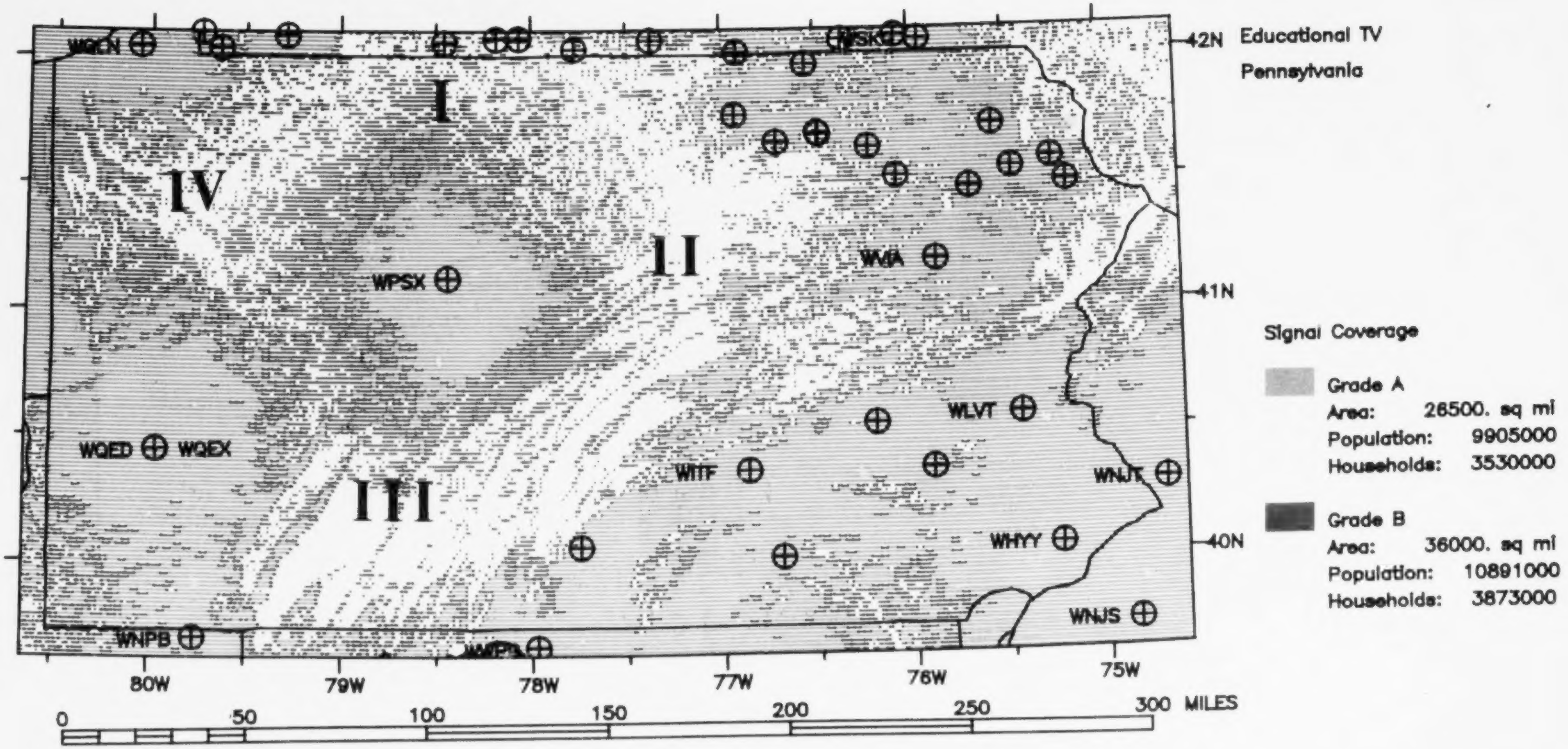
This region, which is composed of state and national forests, is sparsely populated.

Regions II and IV

These regions are more heavily populated than Region I. Over-the-air signals are either non-existent or spotty. Cable coverage is a significant factor in the distribution of public television signals. The coverage patterns in these regions do not allow for precise measurement of the number of unserved residents. We estimate, however, that approximately 60-70 percent of the unserved population resides in these two regions.

Region III

This region is unserved for many of the same reasons as Regions II and IV. However, the communities are not densely populated enough to attract commercial cable companies. Terrain will make coverage difficult. However, translators and/or repeater transmitters could be used. Terrain barriers will make either technology expensive to implement.


Educational TV
Pennsylvania
Signal Coverage
Grade A
Area: 26500. sq mi
Population: 9905000
Households: 3530000
Grade B
Area: 36000. sq mi
Population: 10891000
Households: 3873000
42N
41N
40N
80W
79W
78W
77W
76W
75W
0
50
100
150
200
250
300 MILES
I
II
III
IV
WQLN
WVIA
WPSX
WLVT
WQED
WQEX
WITF
WNJT
WHYY
WNJS
WNPB

RHODE ISLAND

Basic Statistics

Total State Population:	947,000
Total Population Receiving Public TV Signal:	945,000 (100%)
Total Population in Uncovered Areas:	2,000

Public Television Stations in State

Community	Call Letters
Providence	WSBE-TV

General Comments

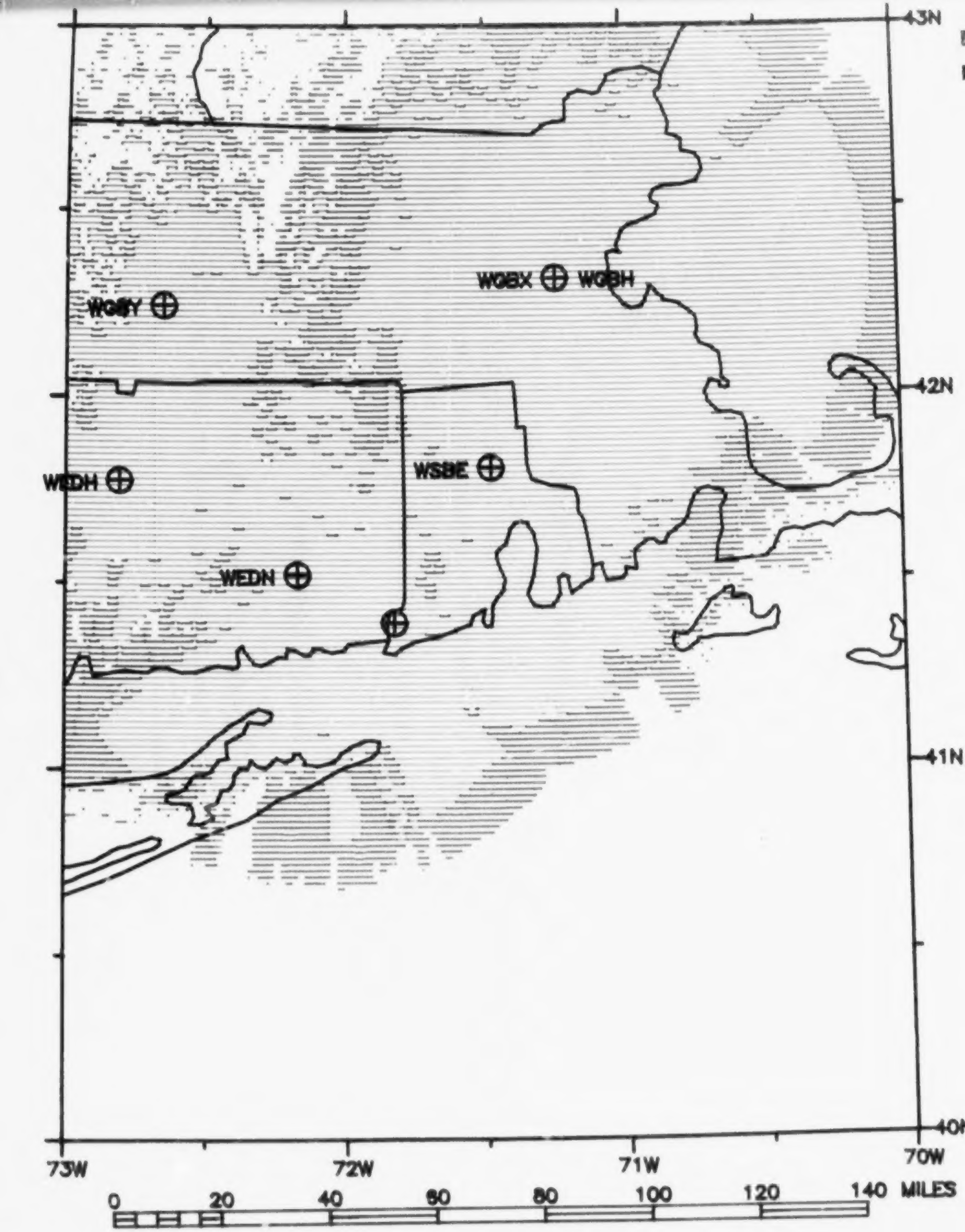
The Rhode Island Public Telecommunications Authority is a state agency that is the licensee of Rhode Island's only public television station, WSBE. Recent NTIA awards for a new antenna and transmitter have enabled WSBE's signal to cover the entire state. Public signals from Massachusetts and Connecticut are also received in Rhode Island.

Uncovered Areas

Rhode Island is essentially covered.

Educational TV

Rhode Island


43N
42N
41N
40N
73W
72W
71W
70W
WGBY
WGBX
WGBH
WEDH
WSBE
WEDN
0
20
40
60
80
100
120
140 MILES

Signal Coverage

▨ Grade A

Area:	2600. sq mi
Population:	940000
Households:	337000

■ Grade B

Area:	3800. sq mi
Population:	945000
Households:	338000

SOUTH CAROLINA

Basic Statistics

Total State Population:	3,122,000
Total Population Receiving Public TV Signal:	3,113,000 (100%)
Total Population in Uncovered Areas:	9,000

Public Television Stations in State

Community	Call Letters
Allendale	WEBA-TV
Beaufort	WJWJ-TV
Charleston	WITV-TV
Columbia	WRLK-TV
Conway	WHMC-TV
Florence	WJPM-TV
Greenville	WNTV-TV
Greenwood	WNEH-TV
Rock Hill	WNSC-TV
Spartanburg	WRET-TV
Sumter	WRJA-TV

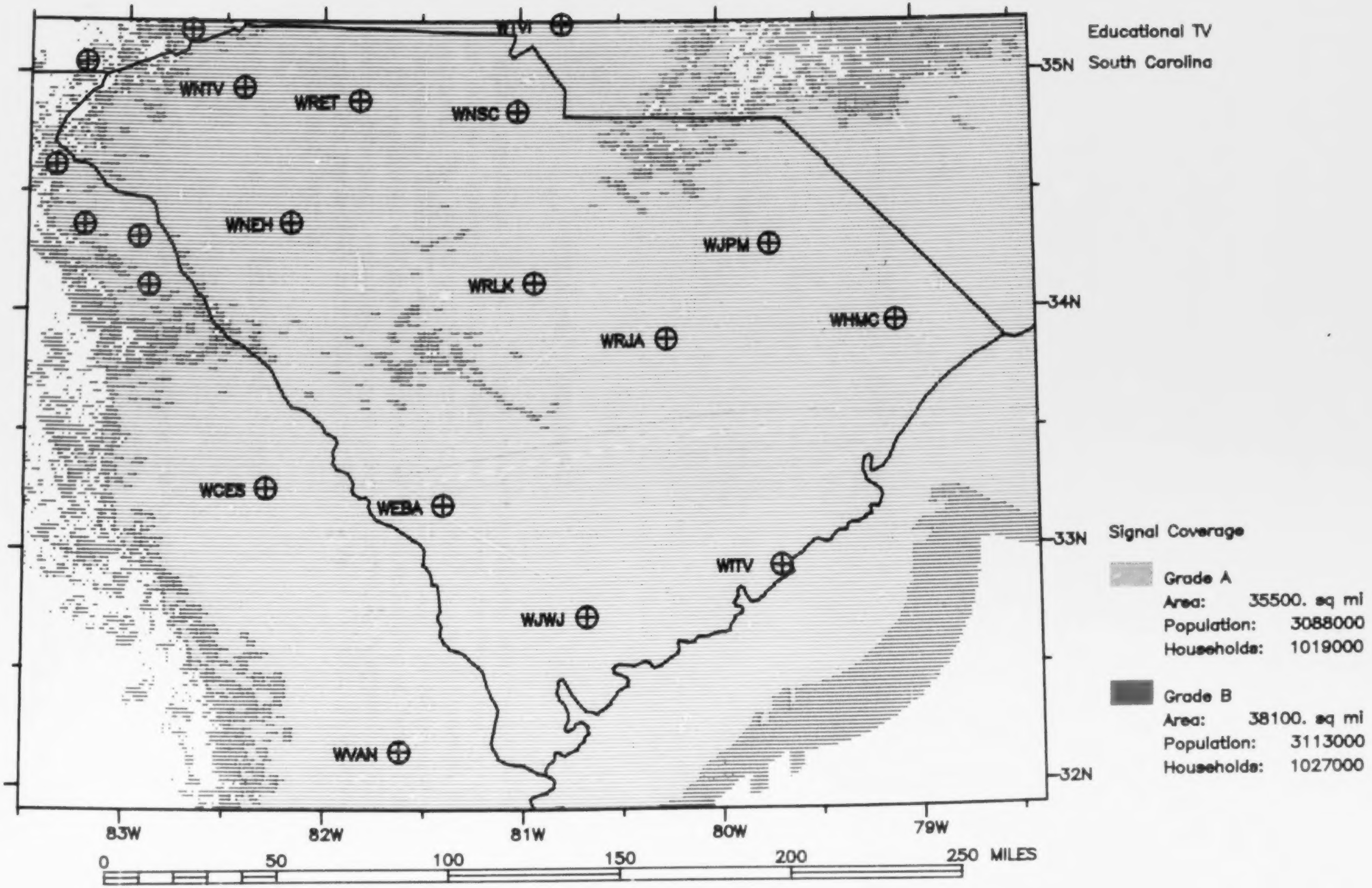
General Comments

The South Carolina Educational Television Commission, based in Columbia, provides a public television service to the residents of the state by means of a network comprising 11 stations. Most of the stations simply repeat the network signal. However, four of the stations (Rock Hill, Spartanburg, Sumter and Beaufort) also have some local origination capability.

Uncovered Areas

South Carolina appears to be almost entirely covered by over-the-air public television signals from within the state or from stations located in Georgia and North Carolina.

An official of the South Carolina ETV Commission noted that the actual coverage of the UHF stations may be somewhat less than illustrated on the coverage maps due to the absorption factors caused by the heavily foliated areas of the state.



Educational TV
South Carolina

WTVI
WNTV
WRET
WNSC
WNEH
WJPM
WRLK
WHMC
WRJA
WCES
WEBA
WITV
WJWJ
WVAN
35N
34N
33N
32N
83W
82W
81W
80W
79W
0
50
100
150
200
250 MILES
Signal Coverage
Grade A
Area: 35500. sq mi
Population: 3088000
Households: 1019000
Grade B
Area: 38100. sq mi
Population: 3113000
Households: 1027000

SOUTH DAKOTA

Basic Statistics

Total State Population:	691,000
Total Population Receiving Public TV Signal:	650,000 (94%)
Total Population in Uncovered Areas:	41,000

Public Television Stations in State

Community	Call Letters
Aberdeen	KDSD-TV
Brookings	KESD-TV
Faith/Eagle Butte	KPSD-TV
Lowry	KQSD-TV
Martin	KZSD-TV
Pierre	KTSD-TV
Rapid City	KBHE-TV
Vermillion	KUSD-TV

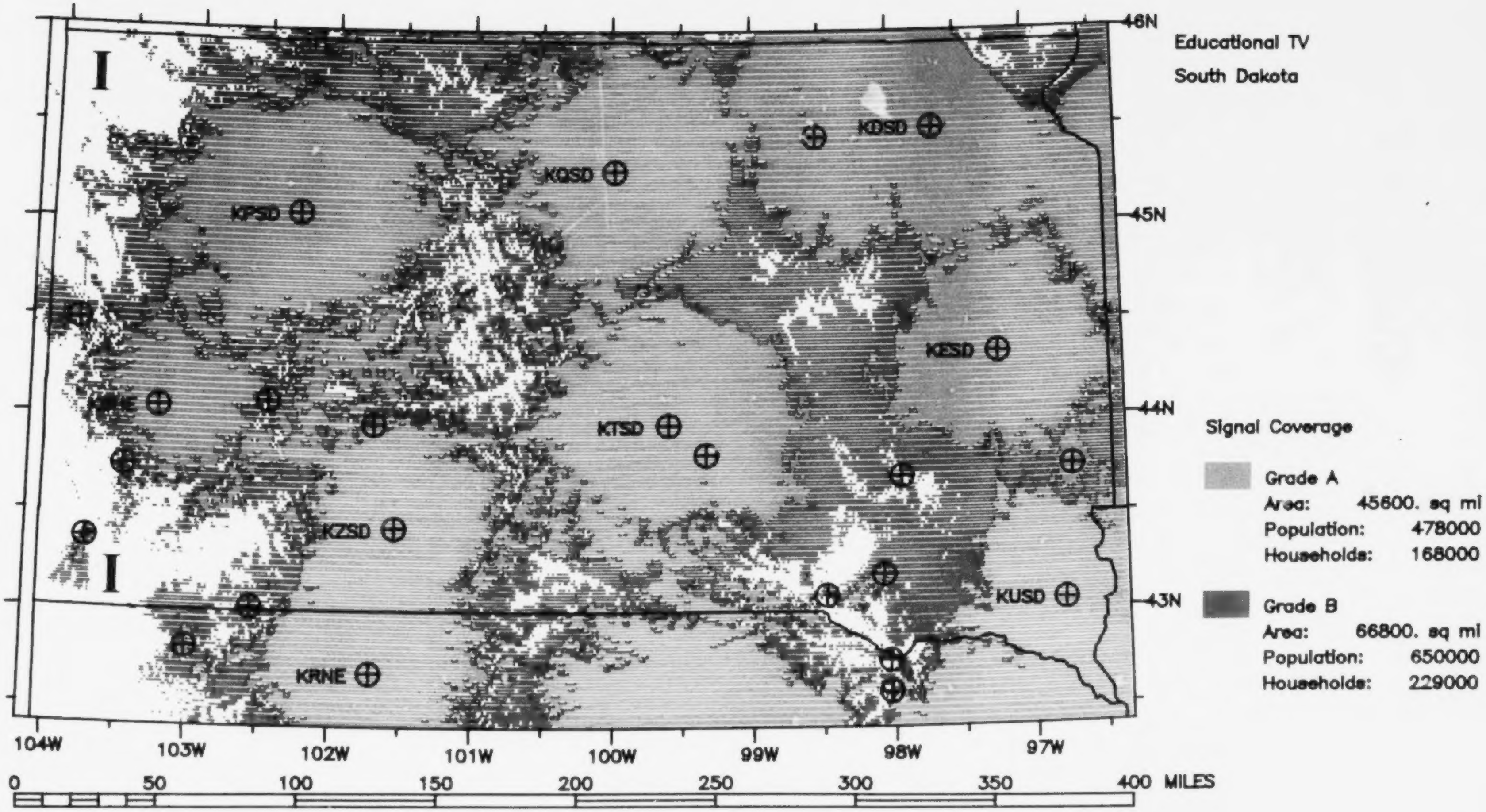
General Comments

Virtually the entire population of South Dakota receives a reliable over-the-air public television signal due to a statewide system of full-power stations, complemented by nine television translators. This system is administered by the State Board of Directors for Educational Television ("SDETV"), with headquarters in Vermillion. In addition, it is expected that TV translators will soon be activated in the communities of Sioux Falls and Chamberlain. Moreover, either the state or private entities have applied for TV translator construction permits to serve the communities of Belle Fourche, Deadwood, Hot Springs, Lead, and Sisseton.

Uncovered Areas

Region I

About the only part of South Dakota not fully served is the extreme western part of the state, either in or near the Black Hills. Once on-air, the television translators to be located in Belle Fourche, Deadwood, Hot Springs, and Lead will extend service to much of the region not presently covered. According to an SDETV official, many of the smaller communities in the Black Hills area receive a public television service from cable television services.


Educational TV

South Dakota

46N
45N
44N
43N
104W
103W
102W
101W
100W
99W
98W
97W
0
50
100
150
200
250
300
350
400 MILES
KDSD
KQSD
KPSD
KESD
KTSD
KZSD
KUSD
KRNE
Signal Coverage
Grade A
Area: 45600. sq mi
Population: 478000
Households: 168000
Grade B
Area: 66800. sq mi
Population: 650000
Households: 229000

TENNESSEE

Basic Statistics

Total State Population:	4,591,000	
Total Population Receiving Public TV Signal:	4,264,000	(93%)
Total Population in Uncovered Areas:	327,000	

Public Television Stations in State

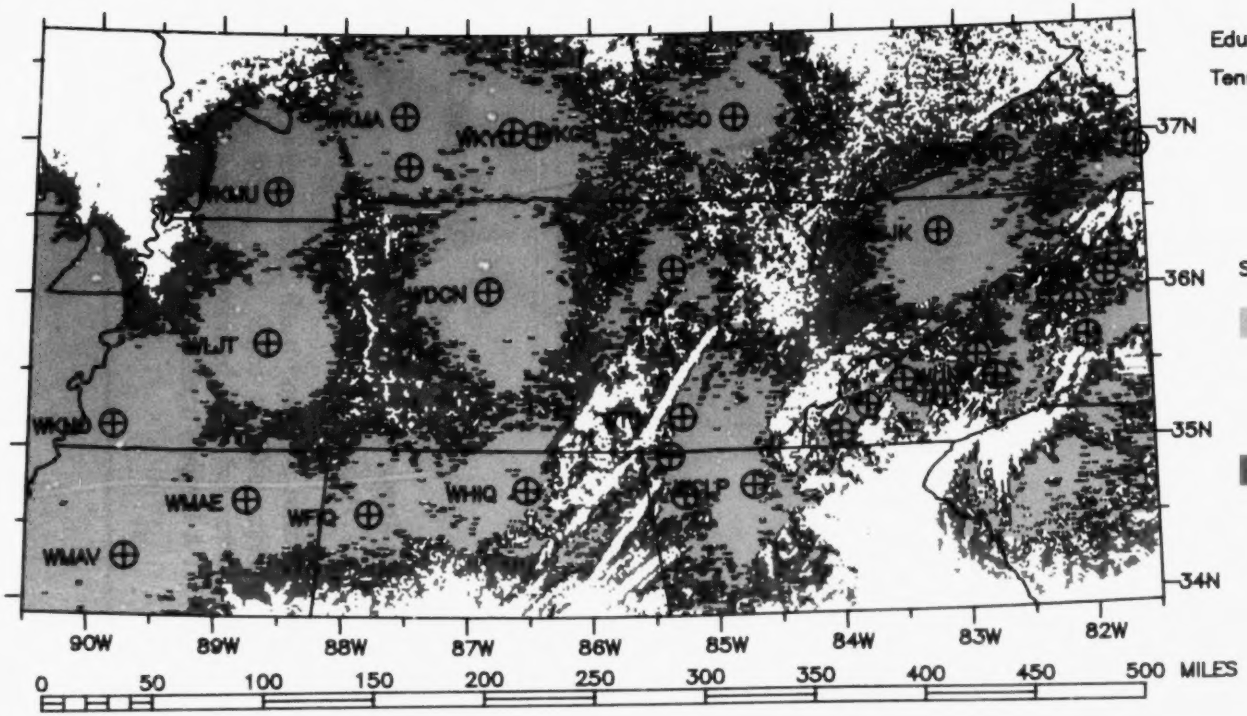
Community	Call Letters
Chattanooga	WTCI-TV
Cookeville	WCTE-TV
Knoxville/ Sneedville	WSJK-TV
Lexington/Martin	WLJT-TV
Memphis	WKNO-TV
Nashville	WDCN-TV

General Comments

The residents of Tennessee receive public television from six individually licensed public broadcast stations. In addition, in some areas the broadcast signals are supplemented by cable television coverage. Virtually the entire state appears to be covered with a public television signal. None of the six public television stations are the license holders of translators.

Uncovered Areas

With the exception of several areas that receive an impaired signal due to terrain factors, virtually all of the state receives a public television signal. In addition to over-the-air signals, receipt of public television by cable television systems is quite common in Tennessee. The FCC has awarded a construction permit for a new station, channel 15, in Knoxville. The activation of channel 15 will provide significant first service to unserved areas as well as eliminate signal strength weakness in parts of Knoxville and the surrounding areas. An estimated 50 percent of the 300,000 people currently not served will be within the Grade B coverage of this proposed new station.


WKMA
WKYU
WKGB
WKSO
WKMU
WDCN
WLJT
WKNO
WMAE
WFIQ
WHIQ
WCLP
WMAV
37N
36N
35N
34N
90W
89W
88W
87W
86W
85W
84W
83W
82W
0
50
100
150
200
250
300
350
400
450
500 MILES

Educational TV

Tennessee

Signal Coverage

▨ Grade A
Area: 26700. sq mi
Population: 3442000
Households: 1209000

■ Grade B
Area: 36600. sq mi
Population: 4264000
Households: 1503000

TEXAS

Basic Statistics

Total State Population:	14,229,000
Total Population Receiving Public TV Signal:	12,288,000 (86%)
Total Population in Uncovered Areas:	1,941,000

Public Television Stations in State

Community	Call Letters
Amarillo	KACV-TV
Austin	KLRU-TV
College Station	KAMU-TV
Corpus Christi	KEDT-TV
Dallas	KERA-TV
Denton	KDTN-TV
El Paso	KCOS-TV
Harlingen	KMBH-TV
Houston	KUHT-TV
Killeen	KNCT-TV
Lubbock	KTXT-TV
Odessa	KOCV-TV
San Antonio	KLRN-TV
Waco	KCTF-TV

General Comments

All the heavily populated areas of Texas now receive a public television signal over the air from a Texas station.

All the public television stations in Texas are autonomous, there being no state system. KCTF, which is an upgrade of a translator in Waco, is a major satellite repeater of KNCT, Killeen. The major stations listed above are complemented by a full-service low-power station operated by Navarro College in Corsicana. The College's signal is repeated by a translator in Fairfield.

Only two out-of-state signals reach into Texas to any great degree. The eastern Panhandle is served by KWET-TV, Cheyenne, Oklahoma. KWET is part of the Oklahoma Education Television Authority system. In the east, the signal of KLTS-TV, Shreveport, Louisiana, protrudes a few miles into Texas; KLTS is operated by the Louisiana Educational Television Authority.

Uncovered Areas

The areas remaining unserved by over-the-air signals tend to be rural and sparsely populated. Some vast stretches of unserved territories have extremely low population levels; many are truly remote and isolated. Moreover, it would appear that by far the greater number of the communities in the "white areas" are small in size and already served by cable television systems carrying public television signals. It also seems that many people living outside the communities receive a public television signal via satellite home dish antennas or by elaborate television receive antennas.

We have identified four major unserved regions.

Region I

The region lies immediately east of the coverage contours of KCOS, El Paso. It extends to the western edge of the Panhandle. This region includes such communities as Pecos, Kermit, Alpine, Fort Davis, Marfa, Presidio, and Van Horn. The terrain here is extremely rugged and mountainous, and the population is low-density. Culberson County provides a good example; its has fewer than 3500 residents, but boasts five distinct mountain chains.

Knowledgeable observers of this region contend that, for all practical purposes, there is no over-the-air coverage in this region and, because of the mountains, not likely to be. However, the region is well served by cable television. At the moment, the cable system in Marfa is carrying KCOS, while the systems of other communities appear to be receiving a PBS signal via satellite. A public television station staff member has suggested that KCOS might someday install some translators so that the cable systems might receive a locally produced service.

The extreme northeast of Region I -- encompassing the communities of Kermit, Monahans, and Pecos -- might be reached over the air from the east, possibly from Odessa/Midland, and served by a series of translators. The relative flatness of the terrain makes such a configuration a possibility. Economics, however, would be an important force in any entity's decision whether to proceed with such a project.

Region II

Region II is the vast range of country immediately to the east of unserved Region I. Region II begins to the north at the southeast corner of the Panhandle and extends south to the Rio Grande. Its eastern boundary is the westernmost contours of the major public television stations in Dallas, Waco, Killeen, Austin, San Antonio, Corpus Christi and Harlingen.

Region II is fairly well settled north of a line drawn from San Antonio to Odessa, for the most part with relatively small communities. South of that imaginary line, however, it is quite sparsely populated.

Conversations with officials of all the stations in this region, plus a perusal of the lists of cable systems carrying the signals of many of these stations, suggest that virtually all of the communities in Region II do indeed feature cable television offering a public television service.

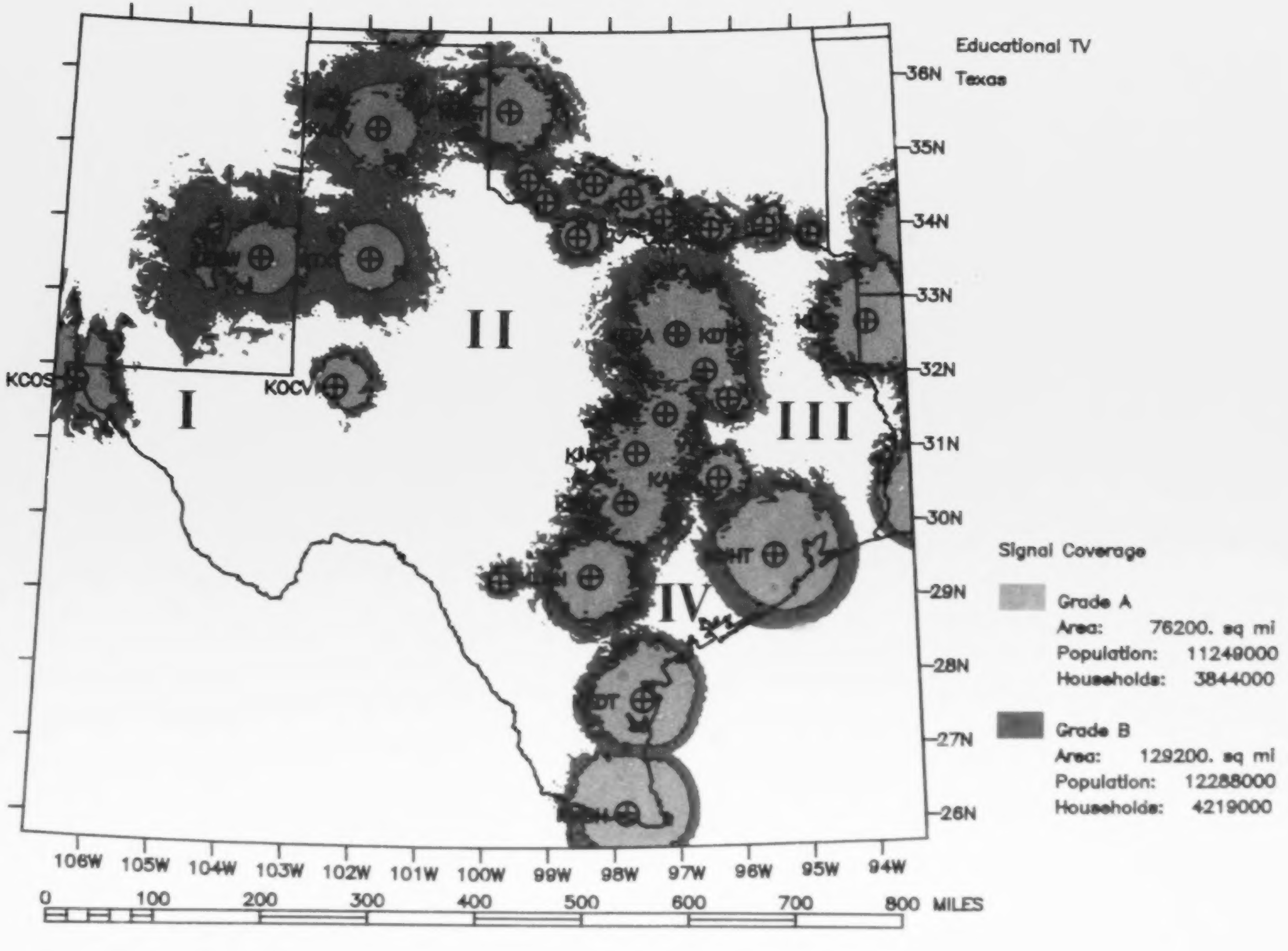
It appears unlikely that there will be much further construction of over-the-air transmission facilities in Region II. The economics of the situation would seem to prohibit it.

KERA-TV has from time to time studied the possibility of transmitting its signal via satellite in order to reach some of the more remote communities in this region. So far, the costs of such a venture have proved to be prohibitive.

Regions III and IV

Region III is immediately east of the contours of KERA, Dallas, and KAMU, College Station. Region IV is the relatively small area between the contours of KEDT, Corpus Christi, and KUHT, Houston, centering on the community of Victoria. Since these regions share so many characteristics, they may be discussed together. The greater number of communities in both are served by cable systems offering public television. In Region III, as reported by one local public television official, many of the residents in the more remote communities have 30' towers for their receive antennas, along with rotors to move the antennas so as to pick up a diversity of signals. This official's impression is that a number of satellite home dish antennas are also present.

Generally, local public television representatives seem to be dubious about most of the communities being large enough to warrant satellite repeaters or translators. Certain communities, such as Victoria and Tyler, might be able to support translators. One local public television official, however, has stated that any signal extension project sponsored by his station would require "a substantial private sector investment for the initial construction, and potentially a corporate subsidy until such a time when individual contributions provide adequate operational costs."



Educational TV
Texas

KCOS
KOCV
KERA
KNCT
I
II
III
IV
36N
35N
34N
33N
32N
31N
30N
29N
28N
27N
26N
106W
105W
104W
103W
102W
101W
100W
99W
98W
97W
96W
95W
94W
0
100
200
300
400
500
600
700
800 MILES
Signal Coverage
Grade A
Area: 76200. sq mi
Population: 11249000
Households: 3844000
Grade B
Area: 129200. sq mi
Population: 12288000
Households: 4219000

UTAH

Basic Statistics

Total State Population:	1,461,000
Total Population Receiving Public TV Signal:	1,341,000 (92%)
Total Population in Uncovered Areas:	120,000

Public Television Stations in State

Community	Call Letters
Provo	KBYU-TV
Salt Lake City	KUED-TV KULC-TV

General Comments

Utah is divided north to south by the Wasatch Mountain Front. This natural boundary has dictated the location of Utah's population centers, the placement of its highway network, and the development of its statewide telecommunications system (EDNET).

Uncovered Areas

Region I

This region is dominated by the Great Salt Lake Desert and is, for the most part, unpopulated. The only area with significant population is the city of Tooele that has a population of 14,000. The state telecommunications system has plans to provide service to Tooele in the near future.

Region II

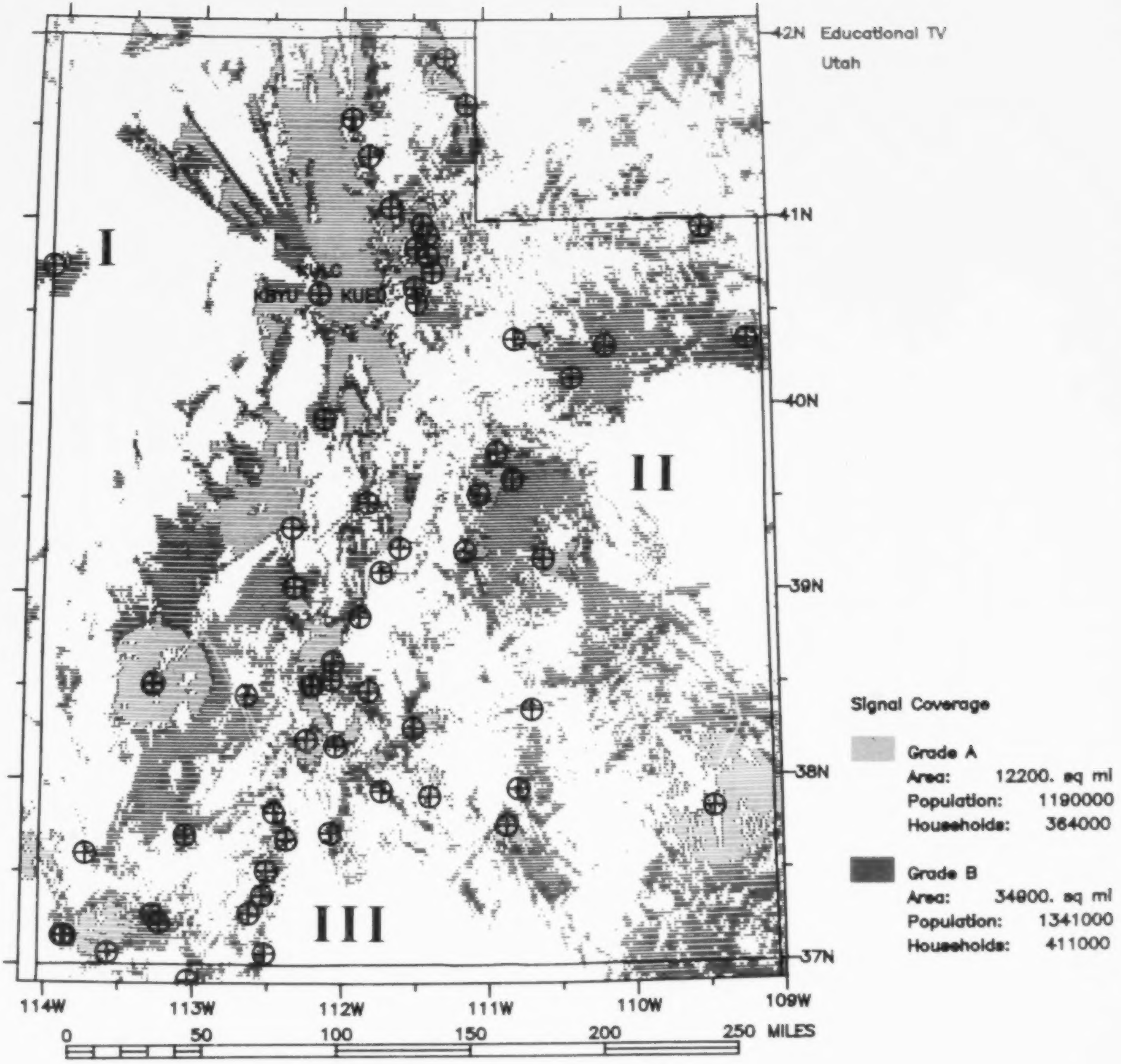
Price (population 9,086) and Moab (population 5,333) are the largest communities in this region. Recently the state telecommunications network extended part of its backbone microwave system to Price so that the signal of KUED-TV and KULC-TV can be delivered to that city. Moab is not presently part of the state network plan. The next step in the network expansion will include an extension to Blanding through Monticello which will complete the public television system. The remaining telecommunications system development will be regional ITFS centers which will be associated with local school districts.

Region III

This area includes the northern section of the Navajo Reservation and the Glen Canyon National Recreation Area. The larger communities in the area, Blanding and Monticello, are presently served by a translated KUED-TV signal. The other towns in the area have less than 100 persons and therefore may be unable to support even a translated signal.

Educational TV

Utah



42N
41N
40N
39N
38N
37N
114W
113W
112W
111W
110W
109W
0
50
100
150
200
250 MILES
I
II
III
KULC
KBYU
KUED
Signal Coverage
Grade A
Area: 12200. sq mi
Population: 1190000
Households: 364000
Grade B
Area: 34900. sq mi
Population: 1341000
Households: 411000

VERMONT

Basic Statistics

Total State Population:	511,000
Total Population Receiving Public TV Signal:	431,000 (84%)
Total Population in Uncovered Areas:	80,000

Public Television Stations in State

Community	Call Letters
Rutland	WVER-TV
St. Johnsbury	WVTB-TV
Windsor	WVTA-TV

General Comments

Vermont's public television coverage is provided by Vermont ETV, a division of the University of Vermont. The main transmitter is located on Mt. Mansfield, outside Winooski/Burlington, where the studios are located. The signal from Mt. Mansfield is fed to the Windsor transmitter which relays the signal to the other three transmitters as well as to three translators located in Manchester, Pownal/Bennington and Wilmington.

Vermont has major mountain ranges running north and south the length of the state, approximately west and east of the lateral midpoint. There are other major mountains and high elevations throughout the state, all of which have a major impact on the reception of broadcast signals.

According to state telecommunications officials, public television is carried on all commercial cable systems, most of which are located in the more populous southern portions of the state. In some small, isolated, mountainous communities where commercial cable is not economically feasible, residents have developed local cable systems which often carry public television.

State officials further indicated that Vermont's uncovered areas are dotted with home satellite antennas that receive raw PBS feeds from the Westar IV communications satellite.

Uncovered Areas

Regions I, II, and III

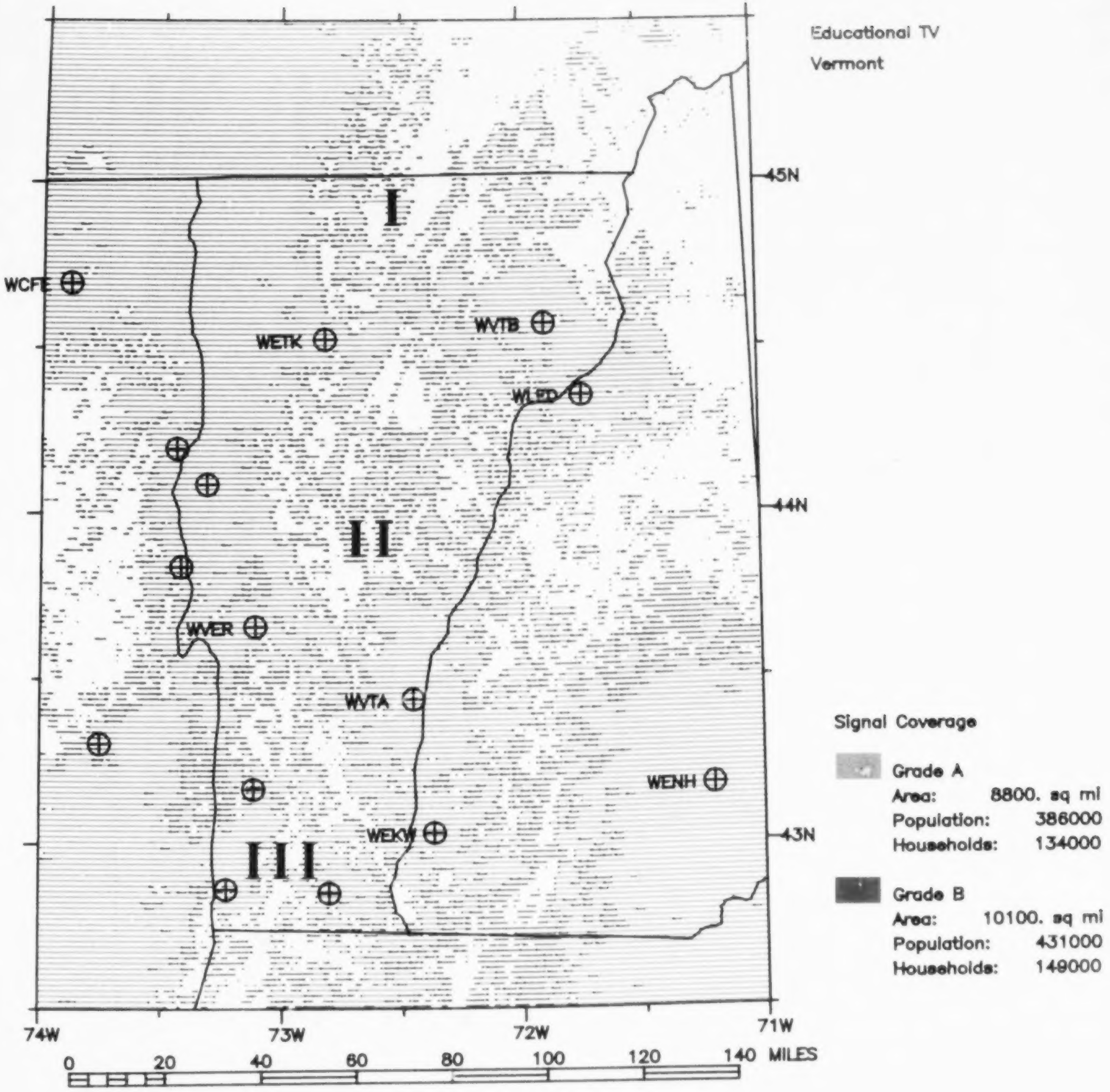
The majority of Vermont's population receives a public television signal. However, this is a mountainous state and the areas that are uncovered -- Regions I, II, and III -- are primarily areas where the terrain or power limitations of existing equipment prevents signal penetration or dependable signal coverage. The uncovered pockets are not densely populated. Some are isolated rural communities with very small populations (as few as 200 people). Some uncovered areas in the state are virtually unpopulated.

Technically, translators could provide signals to the uncovered areas. Power increases for existing transmitters would also increase signal availability by extending the actual radius of the signal and filling in null areas within the current signal patterns.

Vermont ETV has systematically replaced, or is in the process of replacing, old transmitters in Burlington, Rutland and Windsor. It is anticipated that the fourth, located in St. Johnsbury, will be replaced with a more powerful transmitter within the next three years. There are currently no plans to install translators or additional transmitters because the uncovered areas lack a critical mass of population that would make them economically feasible.

Educational TV

Vermont


45N
44N
43N
74W
73W
72W
71W
0
20
40
60
80
100
120
140 MILES
I
II
III
WCFE
WETK
WVTB
WLED
WVER
WVTA
WEKW
WENH
Signal Coverage
Grade A
Area: 8800. sq mi
Population: 386000
Households: 134000
Grade B
Area: 10100. sq mi
Population: 431000
Households: 149000

VIRGINIA

Basic Statistics

Total State Population:	5,347,000
Total Population Receiving Public TV Signal:	5,141,000 (96%)
Total Population in Uncovered Areas:	206,000

Public Television Stations in State

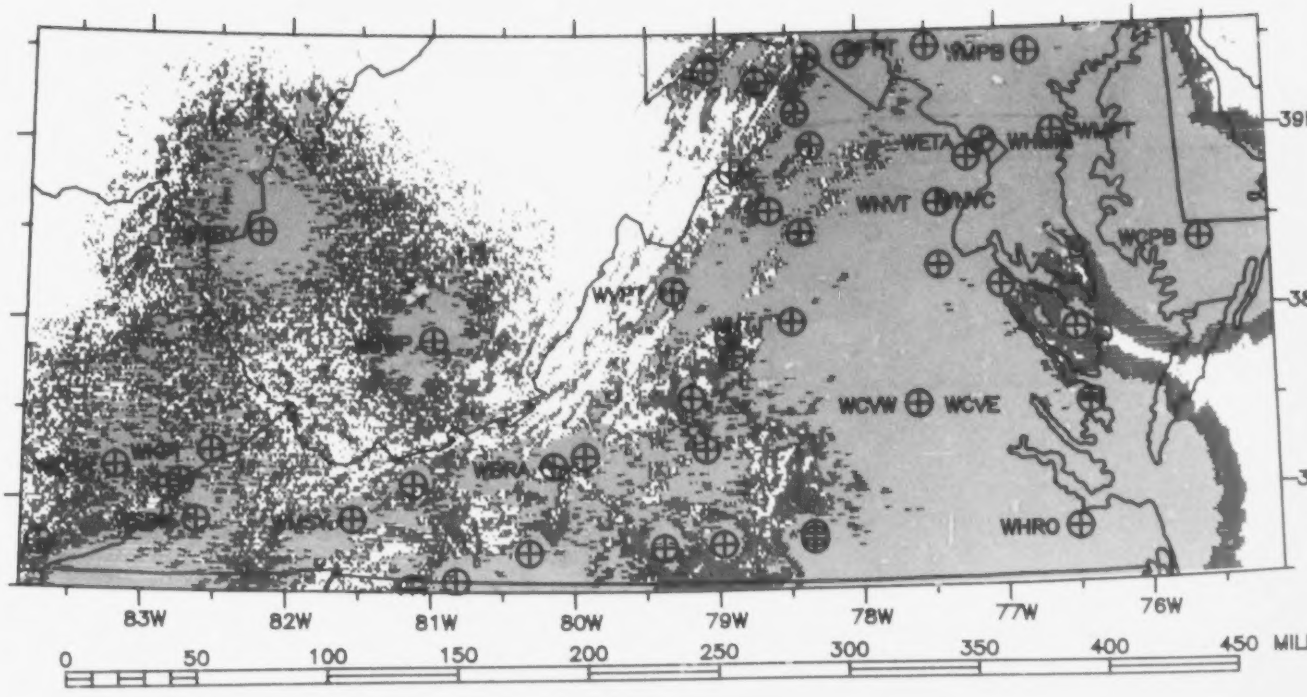
Community	Call Letters
Charlottesville	WHTJ-TV
Fairfax	WNVC-TV
Goldvein	WNVT-TV
Hampton/Norfolk	WHRO-TV
Marion	WMSY-TV
Norton	WSBN-TV
Richmond	WCVE-TV WCVW-TV
Roanoke	WBRA-TV
Staunton	WVPT-TV

General Comments

The vast majority of Virginia's residents receive public television. The Division of Educational Technology is the state agency designated to coordinate public television, which is provided throughout the state by community licensees. Coverage is achieved by the use of translators and repeater stations. Some translators currently serving the Chesapeake area are expected to go out of service by early 1989 because they are tuned to frequencies now allocated for mobile radio. Although these translators are not expected to be replaced, their loss is not expected to significantly impact coverage.

Uncovered Areas

Virginia is essentially covered. The pattern of coverage makes it extremely difficult to isolate specific "white areas." We estimate, however, that slightly over half of the unserved population resides in the extreme western part of the state, in the counties that lie along the West Virginia border and to the west of the signal contours of the Stanton and Roanoke stations.


WMPB
WETA
WNVT
WCPB
WVPT
WCVW
WCVE
WHRO
WBRA
39N
38N
37N
83W
82W
81W
80W
79W
78W
77W
76W
0
50
100
150
200
250
300
350
400
450 MILES

Educational TV

Virginia

Signal Coverage

░ Grade A
Area: 32800. sq mi
Population: 4784000
Households: 1666000

▓ Grade B
Area: 39700. sq mi
Population: 5141000
Households: 1791000

WASHINGTON

Basic Statistics

Total State Population:	4,132,000
Total Population Receiving Public TV Signal:	3,701,000 (90%)
Total Population in Uncovered Areas:	431,000

Public Television Stations in State

Community	Call Letters
Centralia	KCKA-TV
Pullman	KWSU-TV
Richland	KTNW-TV
Seattle	KCTS-TV
Spokane	KSPS-TV
Tacoma	KTPS-TV
Yakima	KYVE-TV

General Comments

The Cascade Mountain range, running from the Canadian border to the Oregon border, divides the state of Washington into two parts. The western portion, with a majority of the state's population, is served by two public television stations. KCTS is a VHF station located in Seattle and has primary coverage throughout the western portion of the state. KCTS is also distributed across the Cascade Mountains via microwave delivery to many cable television systems as far east as Walla Walla.

KTPS is operated by the Tacoma School District #10 and provides instructional and alternate public television service. KTPS has a repeater station in Centralia, KCKA, and uses several translators to serve western Washington.

Central Washington is served by public television station KYVE, Yakima, while eastern Washington is served by KSPS, Spokane, and KWSU, Pullman. The Pullman area also receives service from KUID, Moscow, ID. KSPS, KWSU and KUID all operate on VHF channels. KWSU, Pullman, also has a repeater station, KTNW, to serve the Tri-cities of Richland-Pasco-Kennewick.

Many communities in the north-central portion of the state, on the eastern side of the Cascades, operate translators to rebroadcast the public television signals. The southern boundary of Washington along the Columbia River receives public television service from stations and translators operated by Oregon Public Broadcasting.

Uncovered Areas

Region I

North central Washington consists of the mountainous Colville and Okanogan National Forests adjoining the Canadian border and sparsely populated desert areas west of Spokane to the Cascade Mountains. Coverage from KSPS, Spokane, extends to the Canadian border, though terrain shadows some areas. All major population areas receive KSPS via over-the-air signal, translator or cable television. Those few small communities without KSPS service contain Class B school districts, which means that each has a K-12 school population totaling less than 250. KSPS is working with existing community translators to update their systems to ensure continued availability of public television service.

Region II

The area surrounding Othello and the Columbia National Wildlife Refuge is unserved.

Region III

The Cascade Mountain range, extending the length of Washington from the Canadian border to the Oregon border, consists of continuous national forests, national parks and wilderness areas. An estimated 30-35 percent of Washington's unserved population resides in this region.

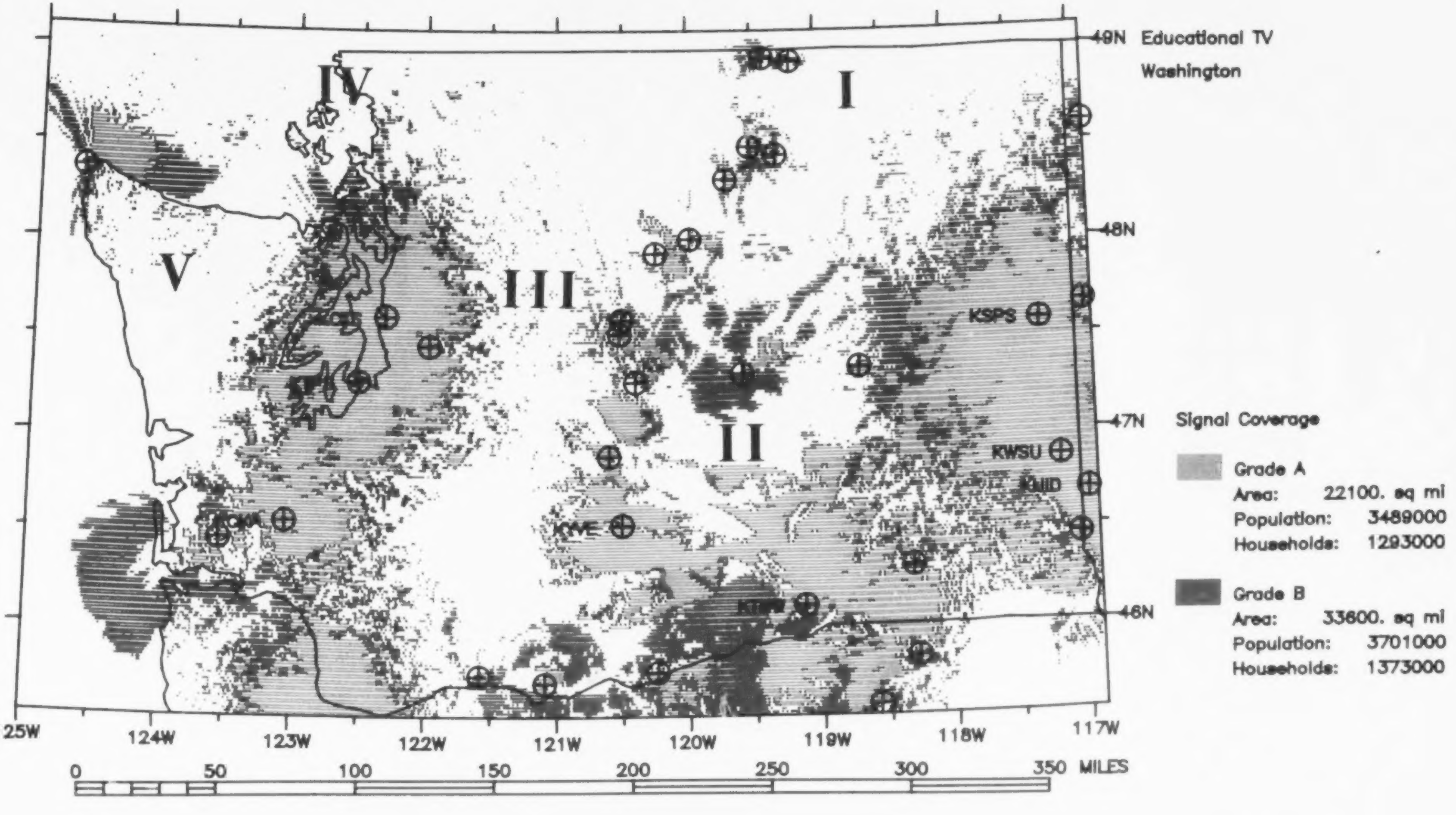
Region IV

The coastal areas of north Puget Sound receives KCTS over the air and via cable. Approximately 70 percent of the households in Skagit and Watcom Counties are cabled. However, reception in some areas, including the San Juan Islands, is spotty because of terrain, signal loss over water, and the presence of a channel 10 on Salt Spring Island, Canada.

Region V

The Olympic Peninsula consists of Olympic National Park and surrounding National Forest. Port Angeles and the major population centers on the northern shore of the

Olympic Peninsula are heavily cabled and receive KCTS, Seattle, via cable. We estimate that close to 40 percent of the state's unserved residents live in this region.


Educational TV
Washington
49N
48N
47N
46N
125W
124W
123W
122W
121W
120W
119W
118W
117W
I
II
III
IV
V
KSPS
KWSU
KUID
KYVE
KTNW
KCKA
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Grade A
Area: 22100. sq mi
Population: 3489000
Households: 1293000
Grade B
Area: 33600. sq mi
Population: 3701000
Households: 1373000

WEST VIRGINIA

Basic Statistics

Total State Population:	1,950,000
Total Population Receiving Public TV Signal:	1,545,000 (79%)
Total Population in Uncovered Areas:	405,000

Public Television Stations in State

Community	Call Letters
Beckley	WSWP-TV
Huntington	WPBY-TV
Morgantown	WNPB-TV

General Comments

By charter, the West Virginia Educational Broadcasting Authority (WVEBA) is the state agency mandated to provide public radio and television to the citizens of West Virginia. It operates the three public television stations noted above as well as translators and the microwave system that interconnects them.

Mountains dominate the topography of unserved Regions I, II, and III. However, the majority of the population in West Virginia receives a signal. The Morgantown station, WNPB, received an NTIA grant in 1988 that will assist it in filling some of the null areas evident in its current signal and in extending its signal to Maryland, Pennsylvania and into other parts of West Virginia.

Cable television is available in much of West Virginia where the population density makes it economically viable. Cable carriage is vital to signal distribution. This is because of the unpredictability of over-the-air signals due to the irregular terrain throughout the state. WVEBA, however, has expressed serious concern regarding continued coverage on cable systems. Since the "must carry" rules were eliminated, some cable systems have dropped some West Virginia public television stations or raised them to higher channels.

Uncovered Areas

West Virginia has three regions unserved by public television.

Region I

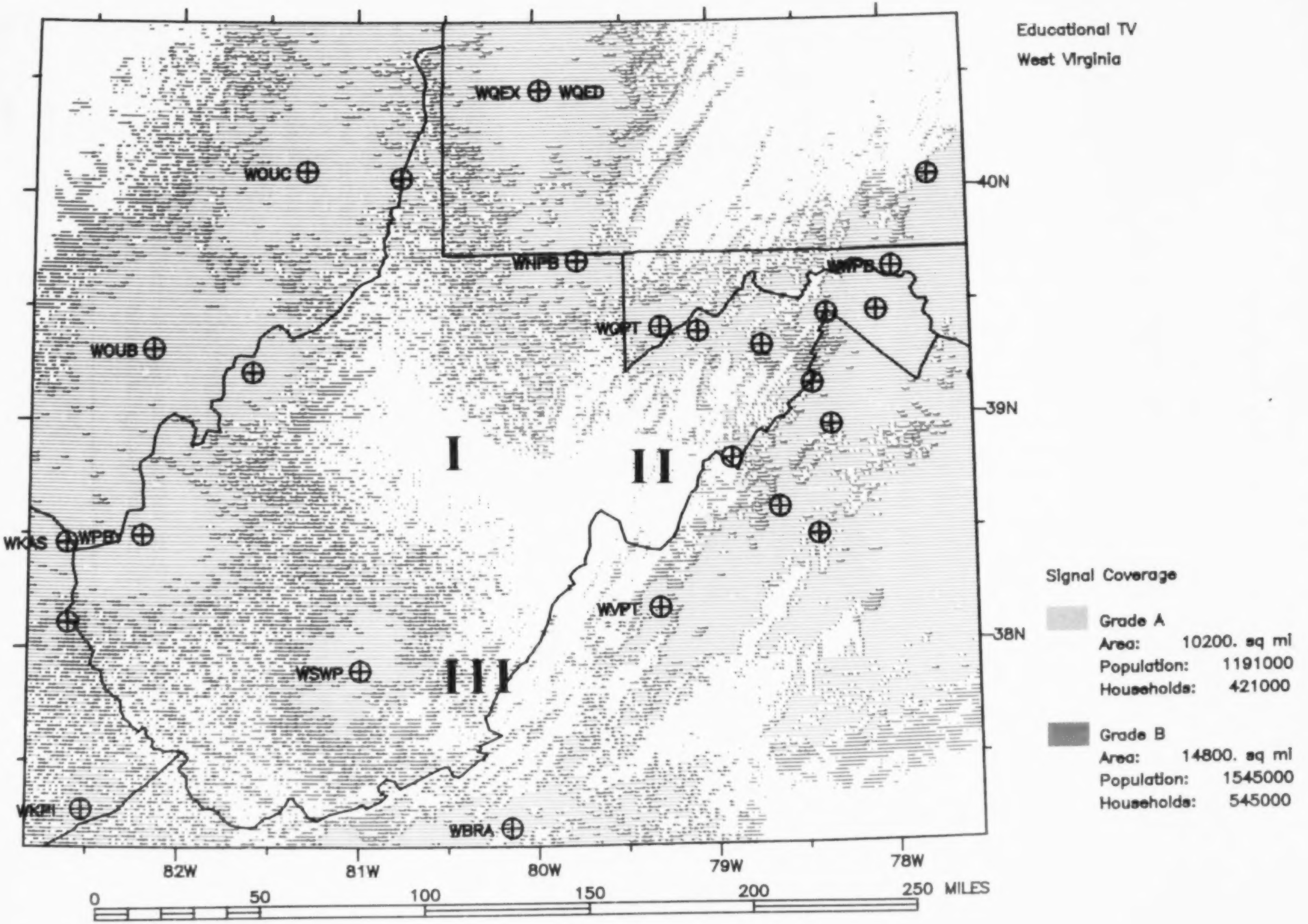
This region, in the central part of the state, is in a mountainous area that has small communities. The larger communities within this area generally have cable service which carries public television. If supported by economic and engineering analysis, a full-power transmitter or translators could be employed to bring a signal into this area.

Region II

This region is the Quiet Zone in which the National Astronomy Observatory is located. This is in the Mononghela National Forest extending into the George Washington National Forest. The Quiet Zone is sparsely populated and severe restrictions are imposed regarding radio waves of any kind coming into the area. It is unlikely that over-the-air public television will be made available here.

Region III

This region is the White Sulphur Springs/Lewisburg area, which has substantial pockets of "white space" due to the rugged topography. Residents have requested service and the population base seems to indicate sufficient economic support for a translator.


Educational TV
West Virginia
WQEX
WQED
WOUC
WNPB
WOUB
WQPT
WMPB
WKAS
WPBY
WSWP
WVPT
WKPI
WBRA
I
II
III
40N
39N
38N
82W
81W
80W
79W
78W
0
50
100
150
200
250 MILES
Signal Coverage
Grade A
Area: 10200. sq mi
Population: 1191000
Households: 421000
Grade B
Area: 14800. sq mi
Population: 1545000
Households: 545000

WISCONSIN

Basic Statistics

Total State Population:	4,706,000
Total Population Receiving Public TV Signal:	4,539,000 (96%)
Total Population in Uncovered Areas:	167,000

Public Television Stations in State

Community	Call Letters
Green Bay	WPNE-TV
La Crosse	WHLA-TV
Madison	WHA-TV
Menomonie	WHWC-TV
Milwaukee	WMVS-TV WMVT-TV
Park Falls	WLEF-TV
Wausau	WHRM-TV

General Comments

All of Wisconsin's well-populated areas and most of its rural sections are served by over-the-air public television signals. This is accomplished by three full-service stations, five major satellite repeaters, and seven translators. The satellite repeaters and the translators are operated by the Wisconsin State Educational Communications Board ("the Board"). The three full-service stations are autonomous but are closely allied with the state system and provide locally originated programming to it. In addition, public television station WDSE-TV, Duluth, the signal of which covers the extreme northwest of Wisconsin, broadcasts a good deal of the instructional programming produced by the Wisconsin state system.

Uncovered Areas

There are five regions of Wisconsin that remain either uncovered or served by a signal that is less than fully reliable. These five regions share many basic characteristics: they are remote, relatively isolated, sparsely populated, and their communities are generally served by cable television systems carrying the state's public television service.

Region I

Region I is found in the northwest part of the state and in fact comprises two small "white areas." One is outside the western contours of WLEF (Park Falls) and the other is slightly to the north, around the community of Ashland. The Board has commissioned an extensive engineering review of the choices available for resolving this problem. The study is still underway. Preliminary results suggest that a medium-power station located somewhere between Haywood and Solon Springs could fill in that "white area." Moreover, it appears that if that station were to have a directionalized signal, then it might extend its reach to the presently unserved area around Ashland. The Board, however, has reached no conclusions about this configuration. A Board staff member said that if the directionalized signal option proves not to be practical, then the Board would most likely consider activating a translator in Ashland. Such a translator would not only cover Ashland but also extend the Wisconsin state system's signal up the entire Bayfield Peninsula, which now receives only an out-of-state signal.

(The Board staff member reports that Ashland has a cable television system that offers the state system's signal, but notes that the cable penetration is almost assuredly under 50 percent.)

Region II

Region II is in the northeast corner of Wisconsin, to the northeast of the contours of WHRM-TV, Wausau. The Board wishes to replace the antennas at WHRM, and WPNE, Green Bay. In both instances, the new antennas would result in strengthened and extended signals into Region I. In the case of WHRM, the estimate is that the new antenna will bring about a 10-15 percent geographic enlargement of the station's coverage. In addition, the Board wants to increase the power of its channel 54 translator in Fence (in Florence County, in the far northeast of the state) and its channel 55 translator at the far end of the Door County peninsular, north of Green Bay. The increase in both cases would be from 100 w to 1,000 w.

Region III

Region III is immediately to the southwest of the contours of WPNE-TV, Green Bay. As noted above, the Board plans to strengthen WPNE's antenna. This should assist the reliability of the coverage into Region III.

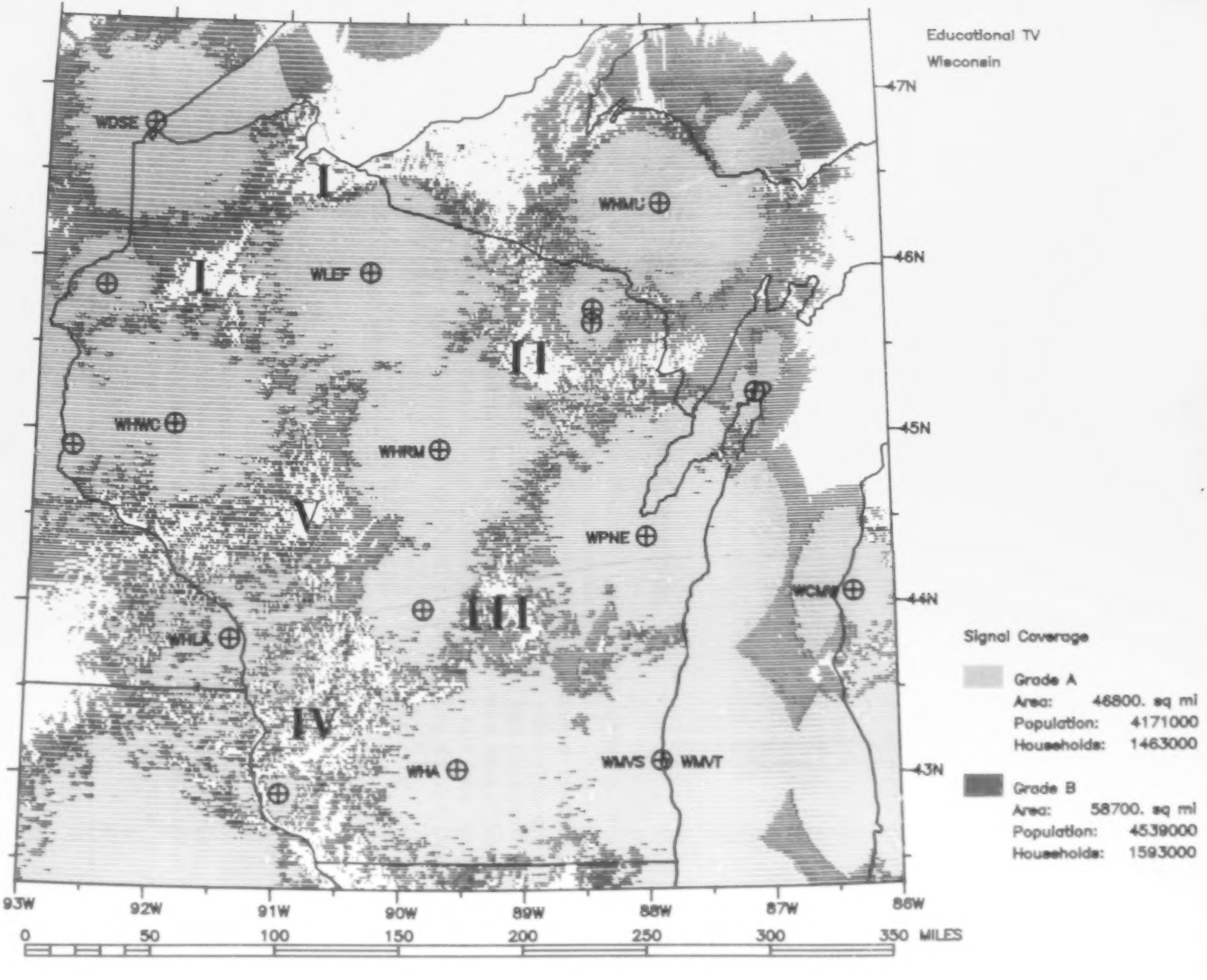
Region IV

Unserved Region IV extends from the Illinois state line to the point where the contours of WHLA and the channel 64 translator in Adams County join. The Board staff member has estimated that the region would probably be best served by a series of 3-4 translators.

Region V

Region V is in west-central Wisconsin and is bounded by the contours of WHWC (Menomonie), WHRM (Wassau) and WHLA (La Crosse). The reception situation in this region should be improved by the projected antenna strengthening of WHRM, which has already been discussed.

(All the antenna replacement projects and translator power upgrades noted in the above discussion are pending before the State Legislature.)


Educational TV
Wisconsin
WDSE
WLEF
WHWC
WHRM
WHMU
WPNE
WCMV
WHLA
WHA
WMVS
WMVT
I
II
III
IV
V
47N
46N
45N
44N
43N
93W
92W
91W
90W
89W
88W
87W
86W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Grade A
Area: 46800. sq mi
Population: 4171000
Households: 1463000
Grade B
Area: 58700. sq mi
Population: 4539000
Households: 1593000

WYOMING

Basic Statistics

Total State Population:	470,000
Total Population Receiving Public TV Signal:	265,000 (56%)
Total Population in Uncovered Areas:	205,000

Public Television Stations in State

Community	Call Letters
Riverton	KCWC-TV

General Comments

Like most of the Rocky Mountain states, Wyoming has a widely dispersed, low-density population. Wyoming has only a few large metropolitan areas; e.g., Casper, Laramie, Cheyenne, Sheridan and Rock Springs. Such low population density inhibits public broadcasting signal extension. Other factors to which Wyoming's relatively low population coverage may be attributed are its unusually rugged terrain and the distances between populated areas and existing signals. In-state public television service from the station noted above is complemented by a mixture of translator and cable television services. Some of these services retransmit the signal of public station KRMA, Denver.

Uncovered Areas

Region I

This area includes Sublette, Lincoln and Uinta Counties and the southern sections of Bridger and Teton National Forests in the southwestern corner of the state. The largest population centers in the area are Rock Springs (population 19,458) and Green River (population 12,807), which do not receive an over-the-air signal but are served by cable. All of the other towns in the area have fewer than 1,000 people. Technically, translators could provide a sufficient signal. However, any plan would have to take into account the negative factors, such as the terrain, distance from an existing signal, and sparse population.

Region II

For the most part, this area consists of Federally controlled land. It is virtually coextensive with Yellowstone National Park. The bulk of the region, therefore, is almost unpopulated and the expansion of public television to the smaller communities in the area may thus be impractical.

Region III

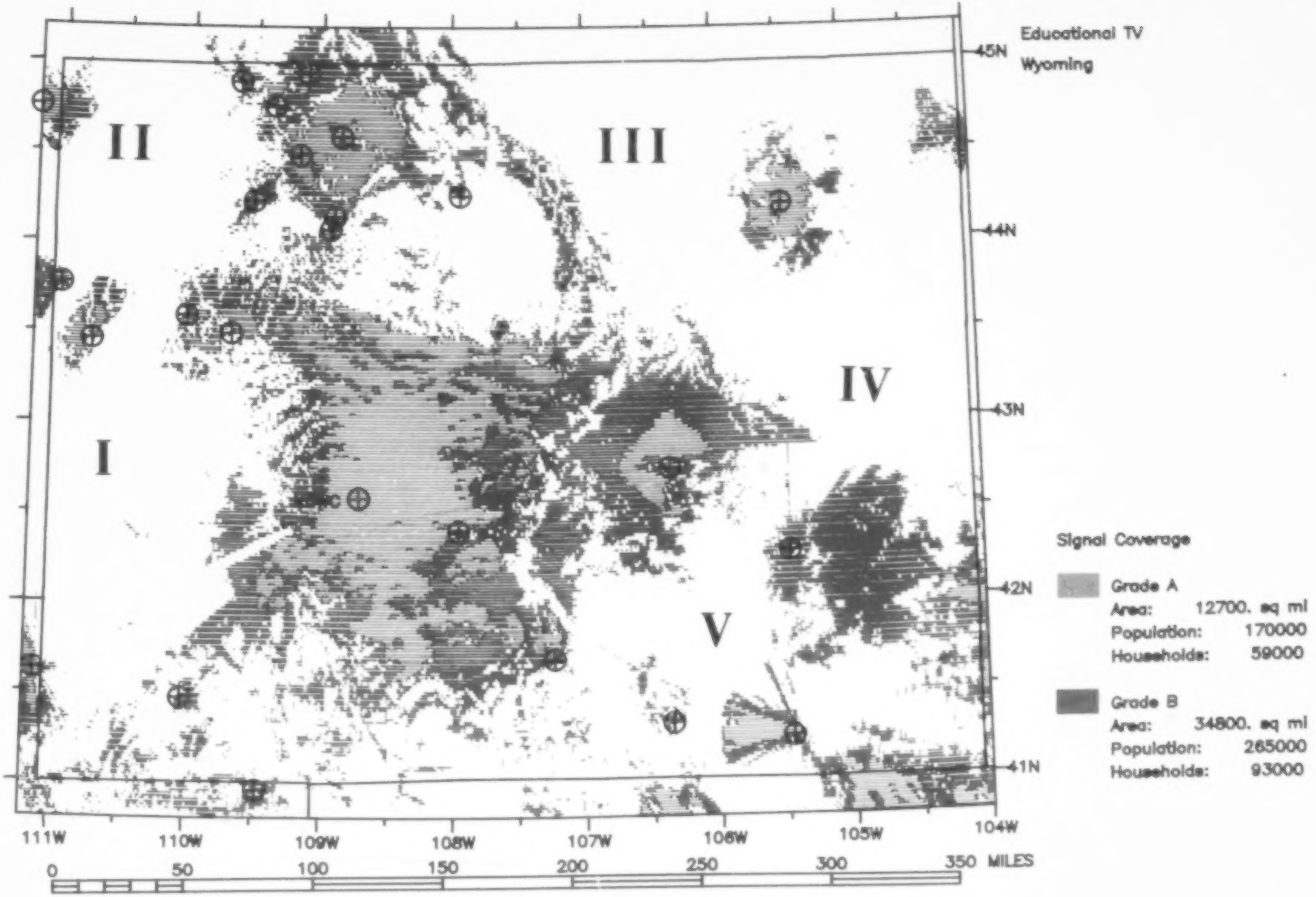
The city of Sheridan is presently receiving a public television signal from its cable television system. Gillette also receives a signal via a repeater from KCWC. Most of the remaining towns in this region have populations less than 500. It is questionable whether such small communities are capable of providing a sufficient financial base for the development of cable systems or translator services.

Region IV

Casper and Newcastle are the largest communities in this region. Most towns have populations less than 200. In the near future, KCWC will expand public television service to Newcastle (3,500) via translator. Due to the lack of population, there are no plans for further expansion in the region.

Region V

In this region -- which is divided by Interstate Rte-80 in Carbon and Albany Counties -- a number of small towns are presently served by cable television systems. The population of the region would appear to be insufficient to justify the expense of developing an over-the-air expansion of service.


Educational TV
Wyoming
Signal Coverage
▨ Grade A
Area: 12700. sq mi
Population: 170000
Households: 59000
■ Grade B
Area: 34800. sq mi
Population: 265000
Households: 93000
I
II
III
IV
V
45N
44N
43N
42N
41N
111W
110W
109W
108W
107W
106W
105W
104W
0
50
100
150
200
250
300
350 MILES

Chapter II

Public Radio Coverage

Analysis Of Public Radio Coverage

Summary Of National Coverage

According to this study, approximately 86 percent of the U.S. population receives at least one public radio signal. This translates to about 195,164,000 U.S. citizens receiving these signals.

The study also calculates that approximately 69,291,000 households out of a total of 80,389,000 households nationwide are able to receive a public radio signal. Of the households served by public radio, approximately 45,108,000 -- or 65 percent -- receive two or more signals.

(For a display of state and regional coverage statistics, see Tables 1-3 at the end of this analysis. A national public radio coverage map will also be found after the tables.)

These findings, when placed beside those of earlier studies, indicate a steady increase in the availability of public radio over the past few years. The 1982 NTIA study cited in an earlier section concluded that 75 percent of the population could then receive a public radio signal.

The statistics reveal a wide range of coverage among the states. Wyoming appears to have the lowest percentage of coverage, at 47 percent. The District of Columbia boasts complete coverage, while 13 states have percentage levels at or above 90 percent.

Another thirteen states have coverage below 80 percent. Among them, a few common themes emerge. One relates to population. The states in question tend to have relatively low population levels. Of the 13 states, seven have public radio coverage percentages below 70 percent, and of these, five have fewer than 1,000,000 residents.

By contrast, of the 13 states that cover 90 percent or more of their populations with public radio, only one -- Hawaii -- has fewer than 1,000,000 residents.

Another theme common to the states with relatively low population coverage is spaciousness. A preponderance of the 13 states below the 80 percent coverage threshold are vast in size.

A third theme is a tendency towards very rugged, mountainous terrain. Six of the 13 states under discussion have such landscape.

As regards the clustering of states with low coverage, it is readily apparent that the northern Rocky Mountain region -- Idaho, Montana, and Wyoming -- has a special coverage problem. We could extend this cluster to include the adjoining states of North Dakota, South Dakota, and Nebraska, all of which have coverage below 70 percent. But the advantages in doing this would be a bit dubious. South Dakota's coverage total will very soon rise, thanks to the major repeater station it will construct in its northwest corner within the next few months. This may bring its coverage to as high as 80 percent. Nebraska is embarking on a public radio construction program that will lift its coverage statistics close to 100 percent within the next few years.

Only one other geographical cluster emerges: the Texas-Oklahoma-Arkansas combination. It is difficult to discern any unifying themes here other than those already noted.

Unserved Major Markets

NTIA's 1982 study of public coverage identified 51 markets of significant size as being uncovered. Of these, 38 are now reached by public radio. Many lie within the secondary service area -- i.e., the 60 dBu contour -- of a full-service station. Others are covered by signals from repeater stations or translators.

Major markets remaining unserved are: Selma, AL; Idaho Falls-Pocatello, ID; Albany and Macon; GA; North Platte, NE; Ardmore-Ada, OK; Johnstown-Altoona, PA; Laredo, McAllen-Brownsville, Odessa-Midland, San Angelo, Tyler, and Victoria, TX.

The issue of service to some of the above 13 market areas, however, is not so clear-cut. The Idaho Falls-Pocatello, ID, region, for example, receives National Public Radio programming from a station that was not included in our study (it broadcasts some religious programming). An application is pending at the FCC to activate a full-service, full-power public radio station in Harlingen, TX, which will serve the McAllen-Brownsville region. Odessa, TX, will be receiving National Public Radio programming by this May, but from a station that was not included in our study (it is primarily student operated). Midland, TX, is already the site of an FM translator retransmitting the service of a neighboring public radio station. And, finally, North Platte, NE, is included in the state's master plan for statewide public radio coverage; the plan's implementation is under way and is scheduled to be completed over the next few years.

Reaching Unserved Regions

A number of observations concerning coverage arose from the NTIA staff's discussions with public radio officials. Here are two of the more general:

- Even in the areas to which coverage may be extended relatively soon, it is improbable that many more full-service, full-power, "stand-alone" stations will be established. In most unserved regions, signal extension is most likely going to be accomplished by the activation of major satellite repeater stations and translators;

i.e., by facilities that retransmit the signals of already-existing stations. Only in communities that are major markets or that contain established organizations -- e.g., an academic institution or an Indian tribal government -- willing to act as licensee, are we likely to see the activation of stations with local origination capabilities.

- A few of the more remote regions -- which are simply too sparsely populated and too distant from "feeder" signals -- are likely to remain unserved for some time.

To understand these observations, the reader must recognize how difficult it is to install and maintain any radio station, including a major satellite repeater station. A local group wishing to activate a station must be able to raise enough money to secure a construction permit from the FCC, purchase the equipment for transmission and program production, secure tower and studio site rental agreements, and hire enough staff to get the station on-air. These costs can easily total many hundreds of thousands of dollars.

Moreover, the group must be able to keep the station maintained and on-air until the station begins taking in money -- from donations, underwriting, CPB Community Service Grants, foundations or whatever -- to defray the station's ongoing operations and maintenance expenses.

A major satellite repeater station, of course, would not require money for production equipment and staff. Nonetheless, the microwave links that are often required to connect the repeater station to the "host" station can add greatly to the start-up expense. It is not uncommon for FM radio satellite repeaters to entail $250,000 or more in equipment costs -- and this assumes a tower is already in place and available. (Appendix B provides a more complete summary of repeater station costs.)

The obstacles are even more formidable in rural areas, simply because fewer people live there and thus less local financial support will be available to cover the expenses.

Recently, a new type of noncommercial radio station has emerged that may offer some hope to small, remote communities wishing to construct stations that are more than repeaters. Although the concept is commonly called the Rocky Mountain Alternative Station (RMAS), it is applicable nationwide. An RMAS allows a community to establish a cost-effective public radio station with some local origination capability.

An RMAS' power may not exceed 100 w. The station must repeat the signal of a primary station for at least half of the RMAS' broadcast day. It is allowed to originate local programming for the remaining half of the day, or for any portion of that time. It may receive the signal it is repeating either over the air, by microwave, or via communication satellite. And, because the RMAS is indeed a station, not a translator, it cannot be "bumped" by subsequent station activation.

Most importantly, an FCC waiver excuses the RMAS from the FCC's requirement that the station have staff in attendance for the period it is acting as a repeater. This waiver dramatically reduces the station's operating costs and makes the RMAS concept attractive in terms of cost-effectiveness.

Other Factors Inhibiting Extension

In addition to start-up and maintenance costs, other factors exist that may impede efforts to extend public radio service.

Terrain problems will sometimes increase the difficulty -- and the costs -- of serving a given community. Mountainous area are notoriously troublesome to reach. (The reader will remember that many of the states with relatively low coverage percentages feature rugged mountain regions.) But mountains are not the only terrain factors complicating signal extension. Communities in river bottoms also may encounter exceptional reception problems caused by terrain. The northeast Iowa/northwest Illinois border, along the Mississippi River, illustrates this situation. There, public radio signal reliability is questionable in the communities right next to the river because of the bluffs that lie along the river.

A lack of frequencies available in the protected noncommercial educational FM band may hinder signal extension in a few areas.

Frequency unavailability in a given area can stem from a number of causes. What follows are three of the more common.

- Competition from a multitude of other noncommercial stations. Sometimes this competition might take the form of an abundance of low-wattage noncommercial stations or the presence of high-wattage noncommercial stations not used for the transmission of "public" signals. While these stations may be providing valuable services, usually to specific audiences in the community, their presence can preclude the activation of a full-power, full-service public station there. A good example of this situation may be found in Long Island, in the region immediately adjoining New York City. There, a public television station that wished to establish a full-service public radio station performed an extensive frequency search, only to find it was blocked by a proliferation of already existing low-wattage stations.

- The presence of frequencies reserved for Canada or for Mexico. From time to time, this situation arises with proposed stations and translators along the U.S. international borders. When it does, the regulatory procedures involved will sometimes slow the process of construction permit approval. This was the case with an expansion project in northern Montana and with a planned new community station to be located in Bellingham, in northwest Washington, which would reach unserved areas in the Puget Sound region.

- Proximity to a TV station operating on channel 6. The portion of the FM band reserved for noncommercial educational stations is immediately adjacent to the frequencies used by channel 6 television stations. This raises the potential of harmful interference to the television signal. To avoid this, the FCC has put into place regulations that, under certain circumstances, restrict the location and operations of FM radio stations.

In Wisconsin, for example, the state broadcasting agency's efforts to plan for expansion of its public radio signal have been complicated by the proximity of three channel 6 television stations, one in Wisconsin and two in neighboring Minnesota. Plans to extend service in southern Oklahoma may well be shaped in part in response to channel 6 stations in Tulsa and in Wichita Falls, Texas.

Public Radio Coverage
Summary Tables
and National Map

Table 4

Public FM Radio Coverage By State

Population in thousands

State	State Pop Total	Percent Covered
Alabama	3894	83
Alaska	402	54*
Arizona	2718	86
Arkansas	2286	66
California	23668	96
Colorado	2890	88
Connecticut	3108	98
Delaware	594	84
District of Columbia	638	100
Florida	9746	93
Georgia	5463	81
Hawaii	965	90
Idaho	944	52
Illinois	11427	85
Indiana	5490	76
Iowa	2914	85
Kansas	2364	82
Kentucky	3661	82
Louisiana	4206	84
Maine	1125	83
Maryland	4217	94
Massachusetts	5737	94
Michigan	9262	94
Minnesota	4076	90
Mississippi	2521	95
Missouri	4917	80
Montana	787	48
Nebraska	1570	57
Nevada	800	87
New Hampshire	921	81
New Jersey	7365	85
New Mexico	1303	81
New York	17558	93
North Carolina	5882	85
North Dakota	653	69
Ohio	10798	88
Oklahoma	3025	70
Oregon	2633	89
Pennsylvania	11864	77
Rhode Island	947	80
South Carolina	3122	94
South Dakota	691	73
Tennessee	4591	81
Texas	14229	77
Utah	1461	87
Vermont	511	87
Virginia	5347	85
Washington	4132	91
West Virginia	1950	70
Wisconsin	4706	90
Wyoming	470	47
Total	226549	86

* Including AM radio coverage, percent covered increases to 60 percent.

Table 5

Public FM Radio Coverage By Percentage

Population in thousands

State	State Pop Total	Percent Covered
Wyoming	470	47
Montana	787	48
Idaho	944	52
Alaska	402	54*
Nebraska	1570	57
Arkansas	2286	66
North Dakota	653	69
Oklahoma	3025	70
West Virginia	1950	70
South Dakota	691	73
Indiana	5490	76
Pennsylvania	11864	77
Texas	14229	77
Missouri	4917	80
Rhode Island	947	80
Georgia	5463	81
New Hampshire	921	81
New Mexico	1303	81
Tennessee	4591	81
Kansas	2364	82
Kentucky	3661	82
Alabama	3894	83
Maine	1125	83
Delaware	594	84
Louisiana	4206	84
Illinois	11427	85
Iowa	2914	85
New Jersey	7365	85
North Carolina	5882	85
Virginia	5347	85
Arizona	2718	86
Nevada	800	87
Utah	1461	87
Vermont	511	87
Colorado	2890	88
Ohio	10798	88
Oregon	2633	89
Hawaii	965	90
Minnesota	4076	90
Wisconsin	4706	90
Washington	4132	91
Florida	9746	93
New York	17558	93
Maryland	4217	94
Massachusetts	5737	94
Michigan	9262	94
South Carolina	3122	94
Mississippi	2521	95
California	23668	96
Connecticut	3108	98
District of Columbia	638	100
Total	226549	86

* Including AM radio coverage, percent covered increases to 60 percent.

Table 6

Public FM Radio Coverage By Region

Population in thousands

Region	Pop Total	Percent Covered
North East		
Connecticut	3108	98
Massachusetts	5737	94
Maine	1125	83
New Hampshire	921	81
Rhode Island	947	80
Vermont	511	87
Total:	12349	92
Mid Atlantic		
New Jersey	7365	85
New York	17558	93
Pennsylvania	11864	77
Total	36787	86
East North Central		
Illinois	11427	85
Indiana	5490	76
Michigan	9262	94
Ohio	10798	88
Wisconsin	4706	90
Total	41683	87
West North Central		
Iowa	2914	85
Kansas	2364	82
Minnesota	4076	90
Missouri	4917	80
North Dakota	653	69
Nebraska	1570	57
South Dakota	691	73
Total	17185	81
South Atlantic		
District of Columbia	638	100
Delaware	594	84
Florida	9746	93
Georgia	5463	81
Maryland	4217	94
North Carolina	5882	85
South Carolina	3122	94
Virginia	5347	85
West Virginia	1950	70
Total	36959	88

Table 6 continued

Public FM Radio Coverage By Region

Population in thousands

Region	Pop Total	Percent Covered
East South Central		
Alabama	3894	83
Kentucky	3661	82
Mississippi	2521	95
Tennessee	4591	81
Total	14667	84
West South Central		
Arkansas	2286	66
Louisiana	4206	84
Oklahoma	3025	70
Texas	14229	77
Total	23746	76
Mountain		
Arizona	2718	86
Colorado	2890	88
Idaho	944	52
Montana	787	48
New Mexico	1303	81
Nevada	800	87
Utah	1461	87
Wyoming	470	47
Total	11373	79
Pacific		
Alaska	402	54
California	23668	96
Hawaii	965	90
Oregon	2633	89
Washington	4132	91
Total	31800	94
United States		
Total	226549	86

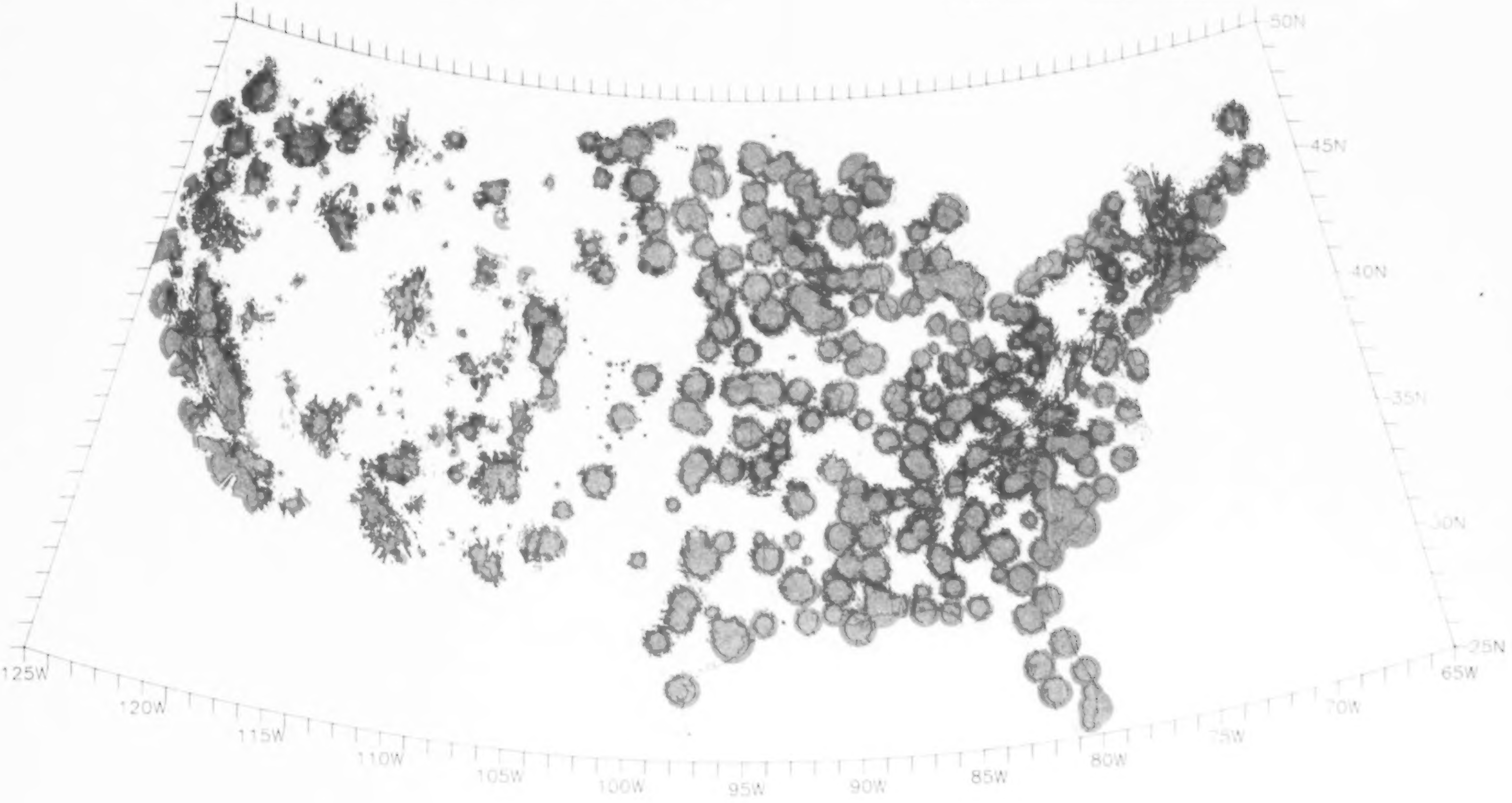
FM Public Radio

United States

Signal Coverage

▨ Primary (70 dBu)
Area: 935500. sq mi
Population: 170980 Thousand
Households: 60835 Thousand

▨ Secondary (60 dBu)
Area: 1483400. sq mi
Population: 195164 Thousand
Households: 69291 Thousand


50N
45N
40N
35N
30N
25N
125W
120W
115W
110W
105W
100W
95W
90W
85W
80W
75W
70W
65W

State Analyses Of Public Radio Coverage

ALABAMA

Basic Statistics

Total State Population:	3,894,000
Total Population Receiving Public Radio Signal:	3,243,000 (83%)
Total Population in Uncovered Areas:	651,000

Public Radio Stations in State

Community	Call Letters
Birmingham	WBHM-FM
Brewton	WYJD-FM
Dothan	WRWA-FM
Gadsden	WSGN-FM
Huntsville	WLRH-FM
Mobile	WHIL-FM
Montgomery	WVAS-FM
Muscle Shoals	WQPR-FM
Troy	WTSU-FM
Tuscaloosa	WUAL-FM

General Comments

The residents of Alabama receive public radio signals from a variety of sources. The stations within the state are licensed to educational institutions or, in the case of WLRH-FM, to the Alabama Educational Television Commission. In addition, signals from the state radio networks in Georgia and Mississippi, as well as some public radio stations in Tennessee and Florida, can be received along Alabama's borders.

Uncovered Areas

There are three major uncovered regions in Alabama. Regions I and II contain, respectively, approximately 39 and 43 percent of the unserved population.

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Region I

This is the area to the west of Montgomery. With the exception of Selma and Demopolis, it is characterized as being rural or small town. Selma would appear to be a good location for a repeater/satellite station.

Region II

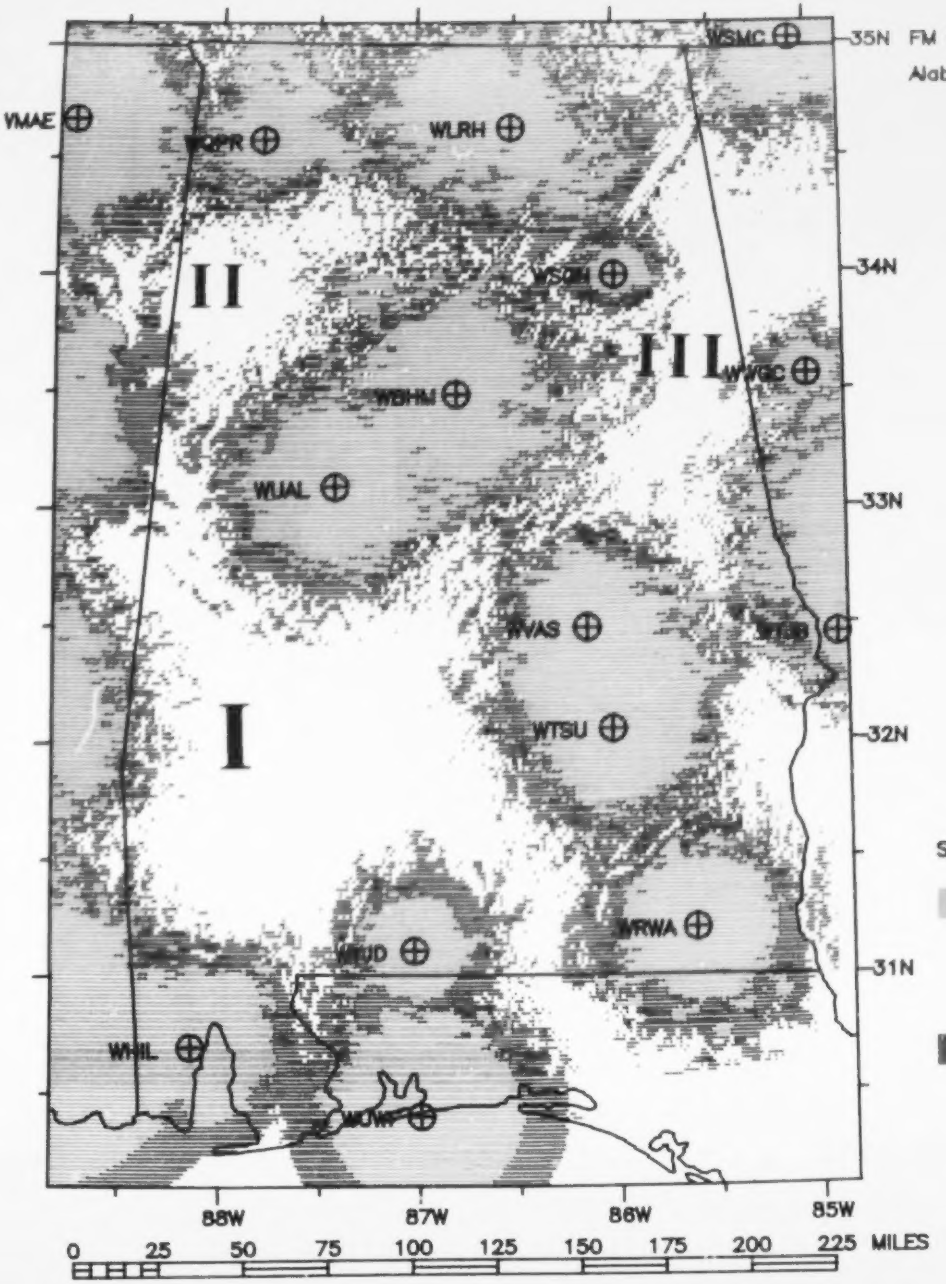
Region II is the area south of WQPR-FM on the coverage map. A series of translators or a repeater/satellite radio station could perhaps provide coverage to this area. With the exception of Russellville, this region could be characterized as consisting of either small towns or relatively sparsely populated areas. Part of this area lies within the William B. Bankhead National Forest.

Region III

This is the crescent-shaped region to the east of the Gadsden and Birmingham stations. Much of this area is within the Talladega National Forest. Efforts are currently underway to seek a power increase of the Gadsden public radio station (WSGN-FM). In addition, University of Alabama public radio station officials have expressed an interest in becoming a joint licensee of WSGN-FM. Should either (or both) of these proposals be achieved, there should be increased service to this region.

FM Educational Radio

Alabama


WSMC
VMAE
WQPR
WLRH
WSGN
II
III
WWGC
WBHM
WUAL
WVAS
I
WTSU
WRWA
WJUD
WHIL
WUWF
35N
34N
33N
32N
31N
88W
87W
86W
85W
0
25
50
75
100
125
150
175
200
225
MILES

Signal Coverage

▨	Primary (70 dBu)	
	Area:	21900. sq mi
	Population:	2706000
	Households:	936000
■	Secondary (60 dBu)	
	Area:	33900. sq mi
	Population:	3243000
	Households:	1120000

ALASKA

Basic Statistics

Total State Population:	402,000
Total Population Receiving Public Radio Signal:	216,000 (54%)
Total Population in Uncovered Areas:	186,000

Public Radio Stations in State

Community	Call Letters
Anchorage	KSKA-FM
Barrow	KBRW-AM
Bethel	KYUK-AM
Chevak	KCUK-FM
Dillingham	KDLG-AM
Fairbanks	KUAC-FM
Galena	KIYU-AM
Haines	KHNS-FM
Homer	KBBI-AM
Juneau	KTOO-FM
Ketchikan	KRBD-FM
Kodiak	KMXT-FM
Kotzebue	KOTZ-AM
McGrath	KSKO-AM
Petersburg	KFSK-FM
Sand Point	KSDP-AM
Sitka	KCAW-FM
St. Paul	KUHB-FM
Wrangell	KSTK-FM

General Comments

Alaska is of course by far the largest of the states. It has three sizable urban communities: Anchorage, Fairbanks and Juneau. It also has a sprinkling of communities that vary in population from 1,000 to about 8,000, and many of those are in the 1,000 to 3,000 range. But the bulk of Alaska's communities are villages the populations of which are numbered in the hundreds -- and sometimes the low hundreds.

Extreme sparseness of population and exceptional vastness of territory, then, are two problems that Alaska faces in extending public radio signal coverage.

Other factors inhibiting extension are ruggedness of terrain and state financial difficulties. The severity of the latter has been such that recently there appeared to be a real possibility that state financial support for public broadcasting would have to be withdrawn. If this had happened, it would have been calamitous for the public radio system.

Alaska's public radio stations are independent. State funding, however, plays an enormous role in station support and in signal extension. This funding is coordinated by the Alaska Public Broadcasting Commission (APBC). The APBC also heads the state's continuing, comprehensive public broadcasting long-range planning process.

Alaska public radio program production benefits from another central coordinating organization, the Alaska Public Radio Network (APRN). The APRN is a nonprofit organization whose membership consists of the public radio stations in the state. It produces, distributes and coordinates programming within the state and to the public radio audience nationwide.

The population coverage statistics stated above include only the totals for FM public radio. If the relevant statistics for the rural grade contours of the plotted AM public stations were added, then approximately 242,000 Alaskan residents would be covered. This translates to a coverage of sixty percent.

The APBC regards the state's coverage to be more extensive than our calculations indicate. It estimates that reliable coverage may be around 90-95 percent. Its calculations, however, are based on a minimum acceptable signal strength -- approximately 40 dBu -- that is less than this study used as a criterion. APBC officials contend that the weaker signals are reliably received because of the "quiet radio environment" that characterizes Alaska.

We should also note that for various reasons this study did not plot one FM station -- KCZP-FM in Kenai -- and two AM stations, KCHU-AM in Valdez and KIAL-AM in Unalaska. Also, another AM station, KNSA-AM, will shortly be activated to serve the community of Unalakleet. In addition, the following communities are served through FM public radio translators not shown on the accompanying maps: Akhiok, Angoon, Cordova, Glennallen, Kake, Kaktovik, Karluk, Klukwan, Larsen Bay, Nuiqsut, Old Harbor, Port Alexander, Point Lay, and Prudhoe Bay. We should mention as well that the community of Nome has a noncommercial AM station which features some religious programming, but which also broadcasts some of the daily news features of the APRN.

Uncovered Areas

Virtually all of Alaska's larger communities are served by public radio. By and large, only remote, isolated villages remain to be covered.

It appears that translators will be the main technology used to extend service throughout Alaska. Given the small size of the communities remaining to be served, it is hard to imagine how they could support full-service, "stand-alone" stations. This, however, does not mean that all the communities now unserved will have to settle for repeaters with no local origination. In the case of Alaska, the FCC has from time to time shown itself willing to allow local programming inserts into translators. Also, Alaska communities have the choice of establishing low-power Class D stations or Rocky Mountain Alternative Stations, both of which allow a combination of repeated programming and local origination.

Distance is a major obstacle facing Alaska in reaching translators or other repeater-type stations from presently operating facilities. Accordingly, in perhaps no other state has more innovative thinking been done in pursuit of alternative delivery systems.

A good part of this innovative thinking has centered on delivery by communications satellite. KDLG-AM, Dillingham, and KMXT-FM, Kodiak, for example, both feed translators or repeater stations by satellite. Each of the signals, however, must be confined to a 3 KHz bandwidth, which often means a service of uncertain quality. Also, this delivery method is relatively expensive.

A recent satellite-delivery innovation is the use of the "band-edge" of the satellite transponder signal that the state leases for delivery of its Rural Alaska Television Network (RATNET). This system is still in the development phase. If it works as hoped, it will provide for satellite delivery to outlying stations in an extremely cost-effective way. However, the "band-edge" system has yet to be fully tested in sustained operation. Moreover, the number of signals that the "band-edge" might accommodate is limited and this has raised questions about how extensive its use might be.

Public radio satellite delivery is also occurring via a RATNET subcarrier frequency. This system would allow a signal to be brought to every village that has a RATNET receive antenna and that in turn means every village with a population total over 25. The signal of station KSKA-FM, Anchorage, is now being delivered by this system. Seward, Unalaska, and Prudhoe Bay are communities benefitting from this service. One disadvantage of this delivery method is that only one station's signal may use the subcarrier frequency. The challenge is to transmit a public radio format sufficiently varied to appeal to the wide range of audience needs and interests present in Alaska, especially those of the residents of the remote villages still to be served.

Traditional microwave or telephone-line interconnection are also utilized to connect full-service stations to repeaters or translators.

As of this writing, all these delivery systems to translators -- except the telephone line interconnect -- require special permission from the FCC. Successful resolution of the Moody Bible filing before the Commission, however, might ease the procedural problems associated with the systems.

Before we begin discussing the specific uncovered areas, we should note that Alaska's stated ambition is to reach every village with a population total greater than 25. The precarious state finance situation and the continuing difficulties in finding technologies that will bring appropriate programming to all the remote, extremely distant villages probably will delay the achievement of this goal for some years.

A satellite transponder dedicated to Alaskan public broadcasting would be the ideal solution. One transponder could carry a public television service and multiple public radio services to the entire state. The cost of such an option, however, will almost certainly preclude its occurring for some time to come.

We shall now turn our attention to the specific uncovered regions.

Region I

Region I largely consists of the Alaskan North Slope. In the east, it extends as far south as Fort Yukon. The population of this area is extremely sparse, a good part of the region being taken up by the National Petroleum Reserve site and the Arctic National Wildlife Refuge. The area is bounded on the south by the Baird, Schwatka and Endicott Mountains.

In spite of our FM map's having no coverage displayed for this region, the area is substantially covered. Barrow is the site of station KBRW-AM, which, with its three FM translators in Point Lay, Nuiqsut and Kaktovik, covers much of the populated areas of the region. Another FM public radio translator exists in Prudhoe Bay, retransmitting the signal of KSKA-FM, Anchorage, via the RATNET subcarrier frequency.

The Fort Yukon area remains unserved. For some years a local group has been attempting to get a station under way, but has been unable to achieve success so far primarily because of funding problems. The future of that effort is still uncertain. If a station is ever constructed to serve Fort Yukon, it will almost certainly devote a good part of its broadcast day to repeating the signal of an already-existing station with local programming inserted for a few hours a day.

Region II

Region II is the vast region that begins at the southern edge of our Region I and extends south to the northernmost point of the Aleutian Islands. It is bounded to the east by a line running from a point about 200 miles to the west of Fairbanks to Anchorage. The region includes Saint Lawrence Island.

The accompanying FM map, on which our official population coverage statistics were based, shows this area to be for the most part unserved. The AM map, however, reveals that many major communities are indeed covered. McGrath, Dillingham, Galena, Bethel and Kotzebue all have AM stations. Another AM station is scheduled to go on-air soon in Unalakleet.

Nonetheless, innumerable villages -- including those on Saint Lawrence Island -- remain without public radio service. Many of these villages are very small, with populations in the low hundreds and in many cases less than 100.

Given the low population density and the vast distances involved, it is apparent that only satellite-fed translators will be used to reach the communities in this unserved region. Since most of the villages have equipment to receive the RATNET signal, the service that would best cover this region would presumably be one that in some manner uses the RATNET transponder.

Region III

Region III is the Aleutian Island chain. All the communities in this region are isolated and small. Public radio coverage is limited to two AM stations, KSDP in Sand Point and KIAL, a 50 w station in Unalaska. Both repeat the signal of KDLG-AM, Dillingham, which they receive via satellite. Both have local production inserts. This would appear to be the only way to serve these distant points: satellite delivery with some local programming inserted.

Region IV

Region IV is located east of Route 3 -- which runs from Anchorage to Fairbanks -- and south of the Yukon Flats area. It is the southeast corner of the main part of Alaska; i.e., all but the "Panhandle."

Part of the community of Glennallen is already served via translator, which rebroadcasts the signal of KUAC-FM, Fairbanks; the translator receives the signal over the air from Fairbanks. Also, Tok may shortly receive a public signal by translator via satellite. Other communities that lie along the major highways that crisscross this region would appear to be candidates for FM translators. Most of the translators will surely be reached by some sort of satellite-delivered signal, although some might be reached over the air.

Along the coast of this region, Valdez is covered by recently activated public station KCHU-AM. Cordova is served by an FM translator, which receives KCHU over the air.

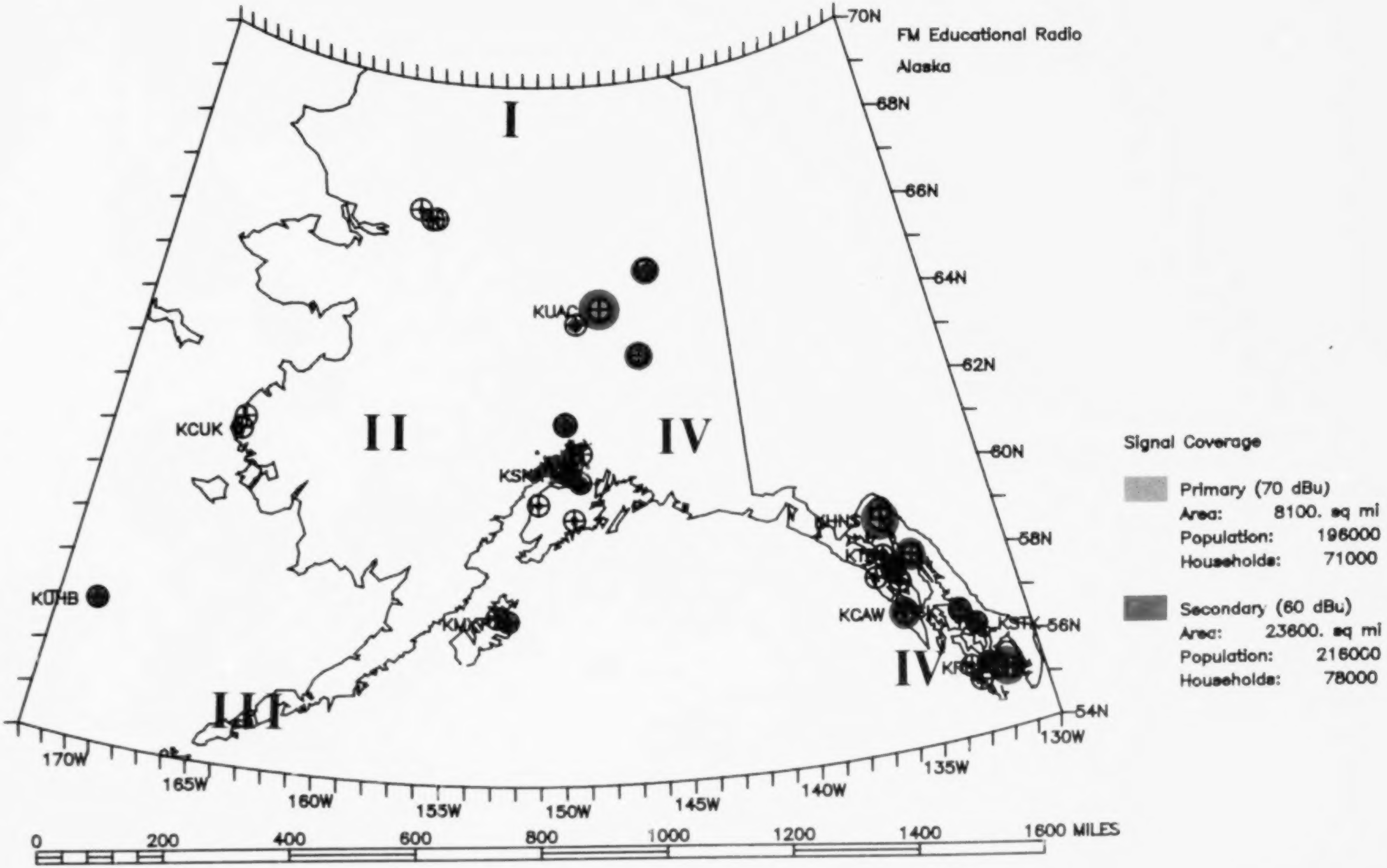
Region V

Region V is the extreme southeast corner of Alaska, often called the "Panhandle." This narrow stretch of territory is extremely rugged, being characterized by mountains, islands and fjords.

Region V is well covered by FM public radio stations. Only some remote, isolated villages remain to be served. All the unserved sites would be best served by FM translators, most likely through some form of satellite delivery.

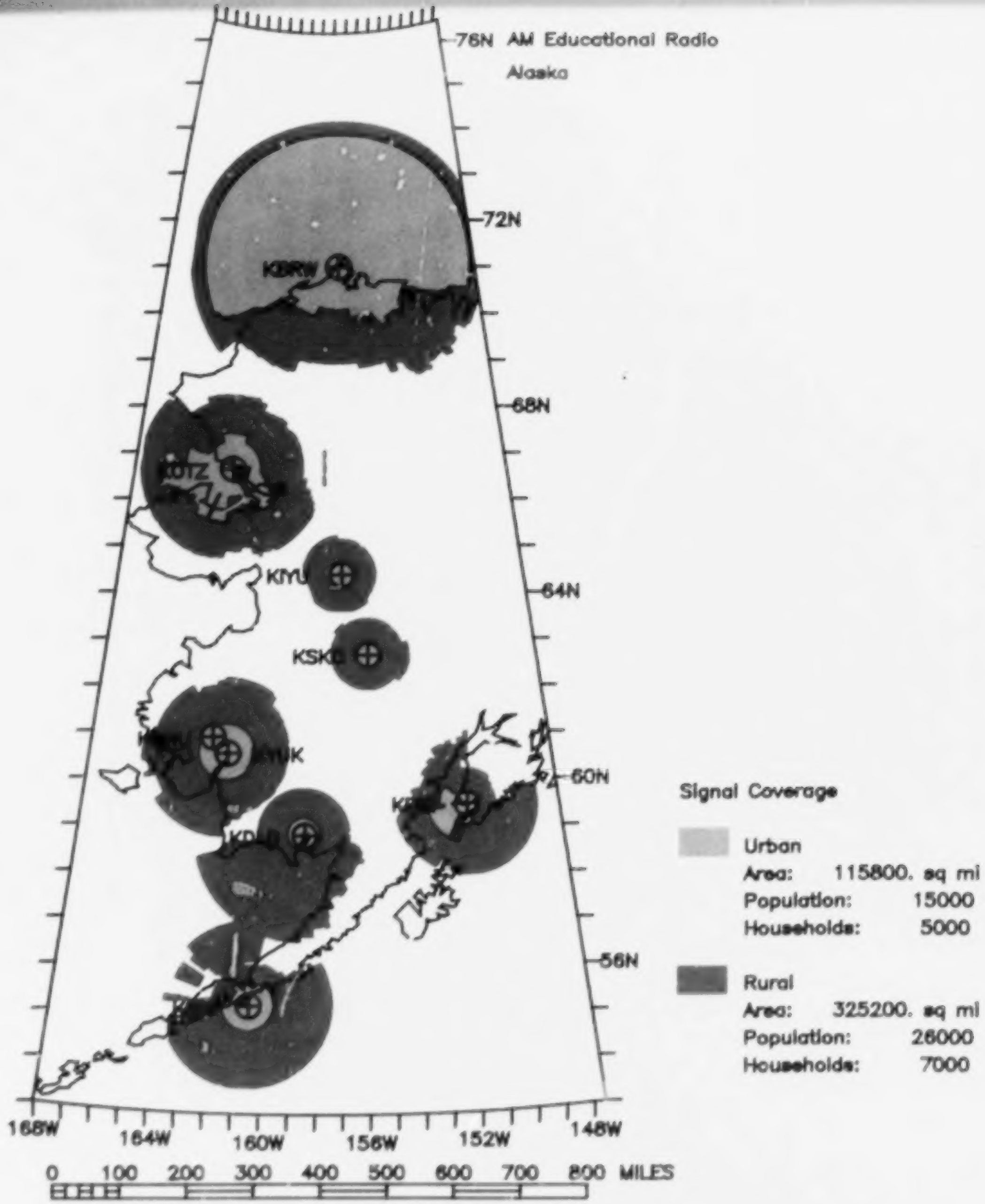
The Panhandle contains some relatively well-populated lumber and mining camps, which might be candidates for public radio service. A translator could be installed at such a location for the life of the camp, which in some cases would be only a few years.

Panhandle communities mentioned as possible translator sites are Yakutat, Elfin Cove, Coffman Cove, Rowan Bay and Hoonah Sound (both logging camps), Point Baker, Port Protection, and Baranof/Warm Spring.


FM Educational Radio
Alaska
70N
68N
66N
64N
62N
60N
58N
56N
54N
170W
165W
160W
155W
150W
145W
140W
135W
130W
I
II
III
IV
IV
KUAC
KCUK
KSM
KUHB
KMX
KHNS
KT
KCAW
KSTK
KR
Signal Coverage
Primary (70 dBu)
Area: 8100. sq mi
Population: 196000
Households: 71000
Secondary (60 dBu)
Area: 23600. sq mi
Population: 216000
Households: 78000
0
200
400
600
800
1000
1200
1400
1600 MILES

AM Educational Radio

Alaska


76N
72N
68N
64N
60N
56N
KBRW
KOTZ
KIYU
KSKO
KYUK
168W
164W
160W
156W
152W
148W
0 100 200 300 400 500 600 700 800 MILES
Signal Coverage
Urban
Area: 115800. sq mi
Population: 15000
Households: 5000
Rural
Area: 325200. sq mi
Population: 26000
Households: 7000

ARIZONA

Basic Statistics

Total State Population:	2,718,000
Total Population Receiving Public Radio Signal:	2,336,000 (86%)
Total Population in Uncovered Areas:	382,000

Public Radio Stations in State

Community	Call Letters
Flagstaff	KNAU-FM
Phoenix	KJZZ-FM
Tucson	KUAT-AM
	KUAT-FM
	KXCI-FM
Yuma	KAWC-AM

General Comments

The vast majority of Arizona's population lives in one of four metropolitan areas -- Flagstaff, Phoenix, Tucson and Yuma. Three are served by full-service FM public radio stations. The fourth community, Yuma, which is also the fourth largest metropolitan area in the state, is served by station KAWC-AM. That station, however, is required to reduce its 1 kw daytime-level power to 147 w at night and this, of course, sharply restricts its reach.

In addition to KAWC-AM, Arizona has another AM public radio station, KUAT-AM, licensed to the University of Arizona, Tucson. KUAT-AM broadcasts at a level of 50 kw, but is a daytime-only station. Its Urban-grade signal reaches over 1,000,000 people, some of whom cannot receive reliable FM public radio. For example, the station offers specialized programming to the residents of the Tohono O'Odham Indian Reservation (formerly the Papago Reservation), which is outside the effective range of the FM public stations.

Because of the two AM stations, the daytime public radio coverage is greater than that calculated above. Uncertainty about the exact extent of reliable AM coverage makes it nearly impossible to state with any confidence how many additional people in Arizona receive public radio from KUAT-AM and KAWC-AM, but it is likely that approximately 100,000 may.

Uncovered Areas

Public radio coverage is inhibited by rugged mountainous terrain and the great distances of many of the unserved communities from an existing signal. In the sparsely populated land masses that do not receive a signal, communities may have as few as 400 residents. The combination of the terrain and isolation of unserved communities may make it economically impractical to provide public radio signals to every location in Arizona.

Regions I and II

Although large sections of these regions are virtually unpopulated, probably about half of the state's unserved persons, as calculated above, reside within them. Most of the regions' unserved people live in or around Yuma, Lake Havasu City, and Nogales; the latter community has been included in this unserved region. The terrain of these regions is rugged and mountainous. Also, they contain significant Indian reservations, a national wildlife refuge, national forests and national parks.

As discussed above, the Yuma area is served by KAWC-AM, the coverage of which is limited rather drastically during the nighttime hours. Arizona Western College, licensee of KAWC-AM, has applied to the FCC for a construction permit to build a new FM radio station which will operate full-time and will cover the entire Yuma market.

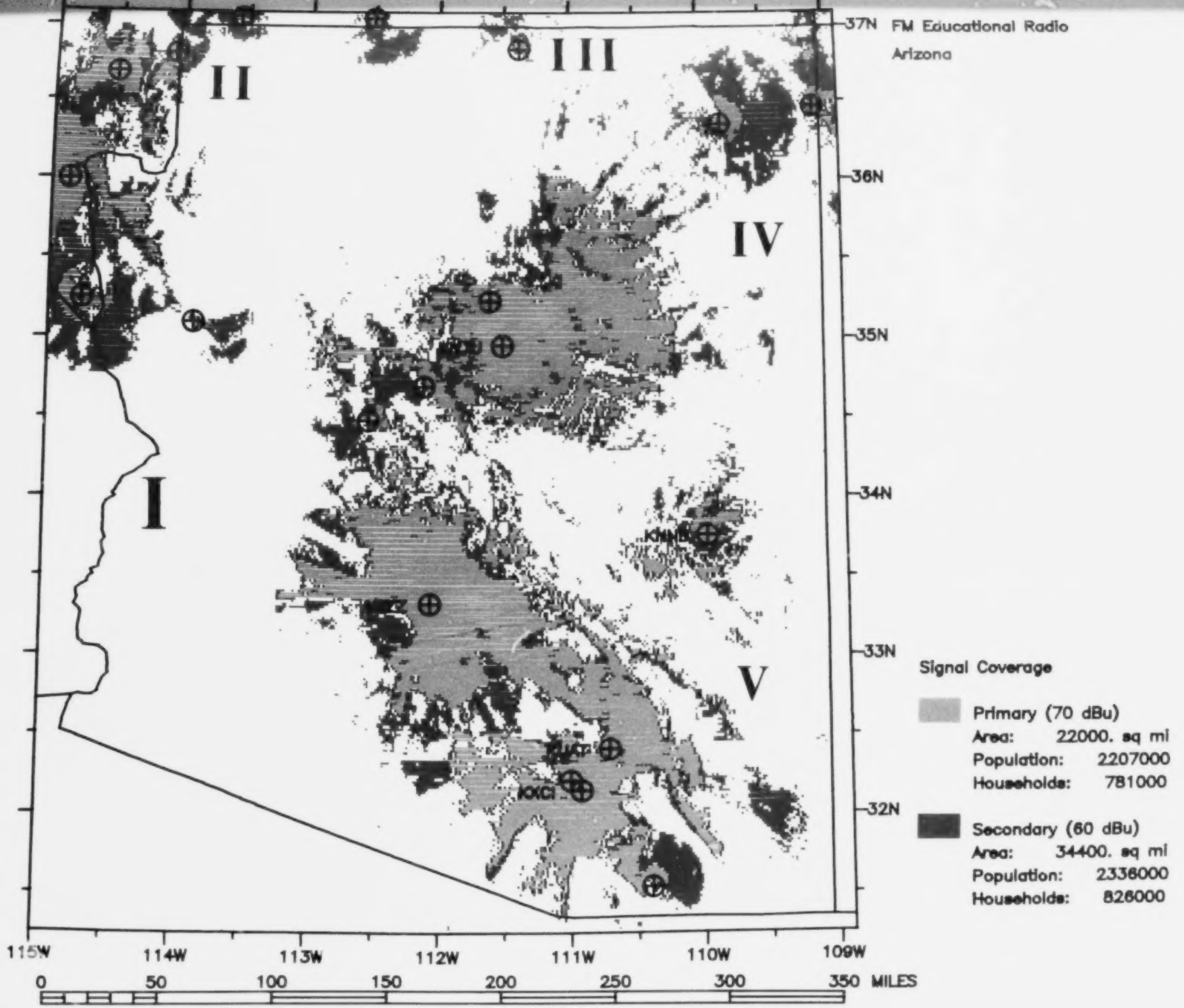
The next largest city in Region I is Lake Havasu City, located on the Colorado River. Both the Las Vegas (KNPR-FM) and Flagstaff (KNAU-FM) public radio stations are projecting translator extensions into this growing resort and retirement community.

All of this upcoming signal extension will take place in Region I. There are no plans at this time to extend service into the less populated Region II.

Regions III, IV and V

All of these regions are mountainous and sparsely populated. Vast areas are composed of Indian reservations, national forests or parks and contain very small communities. In Region III, the Navajo Tribal Council is in the process of developing a low-power television system for the reservation. A major portion of this project will be a microwave interconnection system which could be used to distribute radio signals as well. However, no plans for radio extension exist at present.

In Region V, KUAT-FM, licensed to the University of Arizona, Tucson, has plans to expand via translator to Graham, Cochise and to Greelee Counties. Some of these plans have already borne fruit. In March 1989, for example, KUAT-FM began operating a new FM translator which rebroadcasts its signal to the Safford-Clifton-Duncan area, which encompasses over 13,000 persons. Because of the mountainous terrain, only translators are practical in extending service in this region.

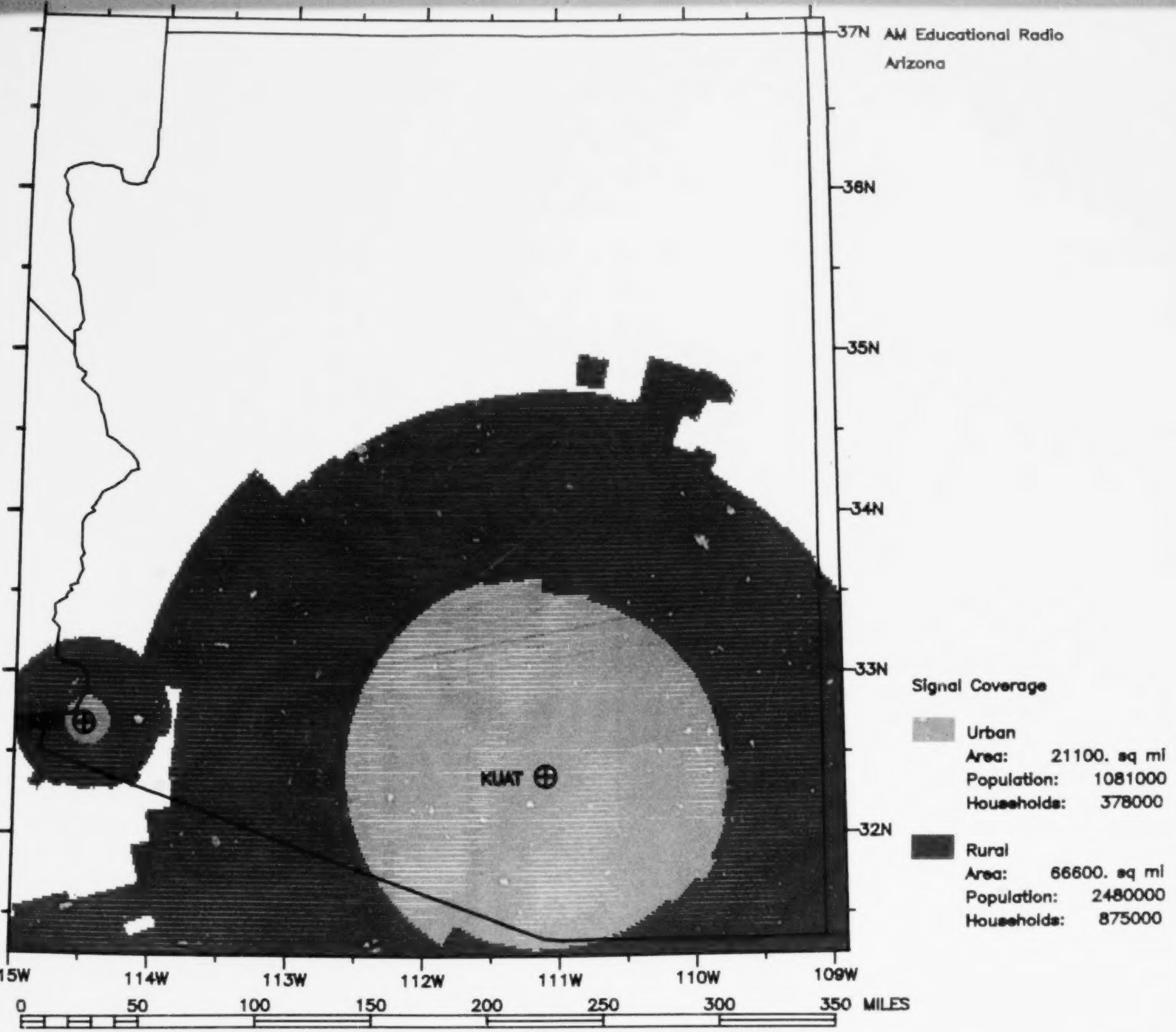


37N
36N
35N
34N
33N
32N
115W
114W
113W
112W
111W
110W
109W
0
50
100
150
200
250
300
350 MILES
I
II
III
IV
V
KXCI
Signal Coverage
Primary (70 dBu)
Area: 22000. sq mi
Population: 2207000
Households: 781000
Secondary (60 dBu)
Area: 34400. sq mi
Population: 2336000
Households: 826000

FM Educational Radio
Arizona

AM Educational Radio

Arizona


37N
36N
35N
34N
33N
32N
KUAT
115W
114W
113W
112W
111W
110W
109W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Urban
Area: 21100. sq mi
Population: 1081000
Households: 378000
Rural
Area: 66600. sq mi
Population: 2480000
Households: 875000

ARKANSAS

Basic Statistics

Total State Population:	2,286,000
Total Population Receiving Public Radio Signal:	1,499,000 (66%)
Total Population in Uncovered Areas:	787,000

Public Radio Stations in State

Community	Call Letters
El Dorado	KBSA-FM
Fayetteville	KUAF-FM
Jonesboro	KASU-FM
Little Rock	KABF-FM
	KUAR-FM
	KLRE-FM

General Comments

Arkansas' relatively congested areas -- the extreme northwest, the extreme northeast, and greater Little Rock -- are well covered by public radio signals.

The greater part of this coverage is achieved by the autonomous stations listed above. The southwest corner and south central region of the state, however, have public radio thanks to services originating out of state. KBSA-FM, a major satellite repeater station in El Dorado, repeats the signal of KDAQ-FM, Shreveport, Louisiana. And the signals of KDAQ and KTXK-FM, the latter licensed to Texarkana (TX) Community College, reach into Arkansas in the far southwest.

Other out-of-state signals play a smaller role in Arkansas public radio coverage. To the northwest are found the southernmost contours of KSOZ-FM, licensed to The School of the Ozarks, Pt. Lookout, Missouri. Along the eastern boundary are the contours of a number of signals from public stations in Tennessee and Mississippi.

Uncovered Areas

It is apparent that Arkansas has significant areas that receive either no public radio signal or an unreliable signal. These areas are rural and, in some cases, isolated.

An Arkansas public radio official expressed the opinion that the relative lack of affluence in the uncovered areas means that we should not expect to witness the construction of any more full-service, CPB-qualified, "stand-alone" stations in the state. This would mean that if the uncovered areas are to receive reliable, Arkansas-produced signals, it will most likely be via repeater stations or, especially in the mountainous areas, FM translators.

Arkansas' uncovered areas may be divided into five regions. Before we discuss them, we should note that three -- Regions I, III, and IV -- have terrain features that would suggest that, strictly in technical terms, major satellite repeater stations, complemented by translators, could be a desirable way to cover them. But we note again that the economics of the situation may work against this technical solution. In other words, it may not be possible for any Arkansas station to support the per-person cost of establishing and maintaining a relatively expensive transmission configuration; translators might have to do.

Region I

Region I is the northern part of the state. Toward the west, this region is mountainous and contains both a National Park and vast areas of the Ozarks National Forest. As one moves to the east, however, the terrain becomes flatter and more populated. The population in this area is extremely sparse. Fulton, Izard and Stone Counties, for example, together contain approximately 30,000 residents.

Region II

Region II consists of a very small "white space" in the far northeast corner of the state, at the edge of the contours of KASU-FM, Jonesboro. Although an acceptable signal below the 60 dBu signal strength may be received in some parts of this region, there are some "patchy" areas. Possible reasons for uncertain coverage there may be (1) the presence of a line of ridges extending into the area or (2) the fact that KASU's antenna is located on the southwest corner of their tower, away from the area in question.

Region III

Region III lies between the Little Rock and Jonesboro signals. The distance involved is so slight that an FM translator might well fill in the gap.

Region IV

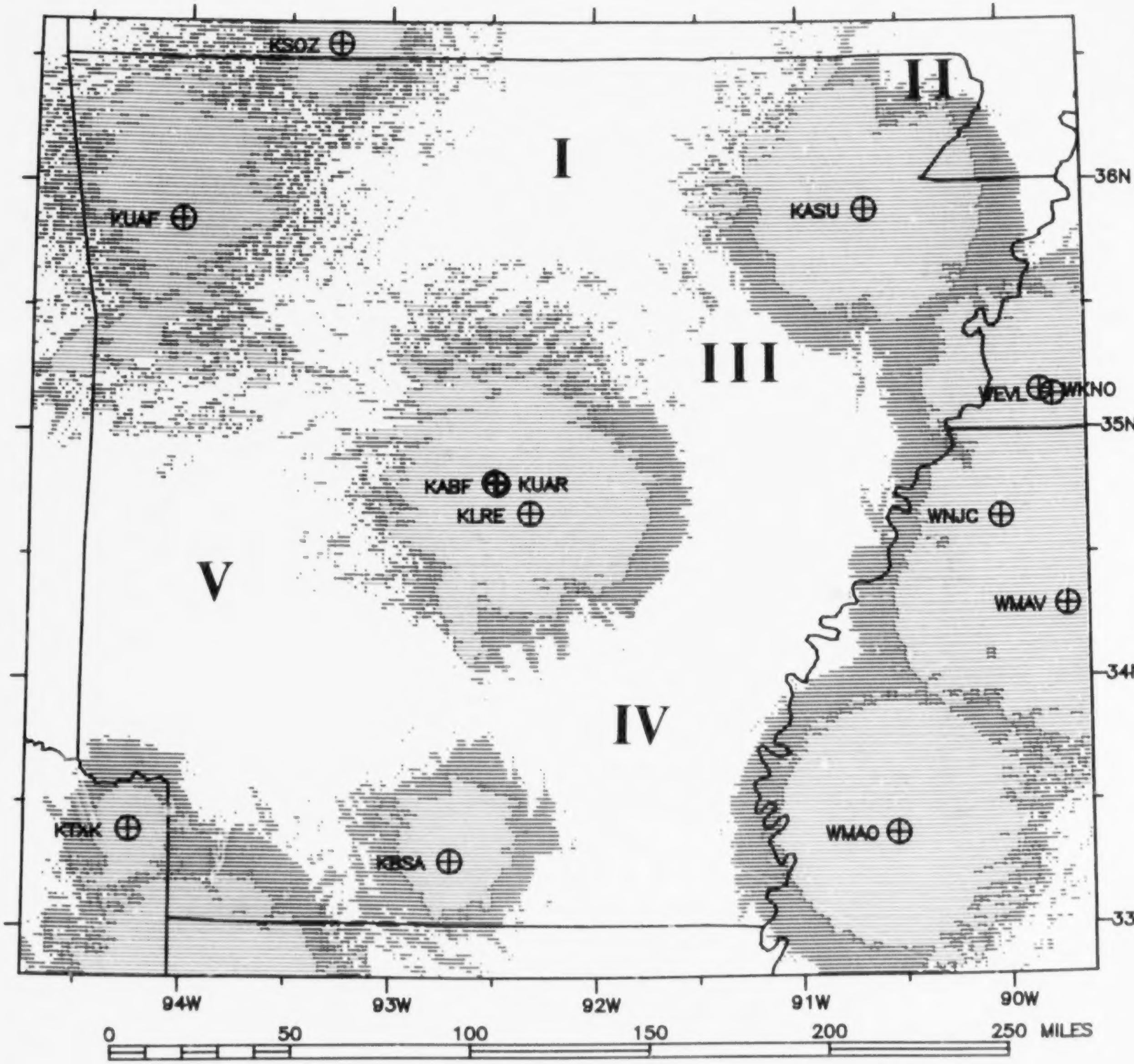
Region IV begins at the southeast corner of Arkansas and extends northward to where the Mississippi, Tennessee and Arkansas boundary lines intersect. This region has a relatively low population density and is virtually uncovered. The topography, much of which is a river delta, is rather flat. Major satellite repeaters would be technically the best way to reach this vast area. But, to repeat, the economics of the matter would probably impede the activation of such an expensive technology and less expensive FM translators may end up being the technology of choice.

Region V

Region V, from Texarkana to Fort Smith, is apparently uncovered. The "white area" extends east to a point somewhat to the east of the community of Arkadelphia. A good deal of this region is mountainous and sparsely populated. Primarily because of this terrain factor, a series of translators would appear to be the most advantageous way to reach the residents of this region.

FM Educational Radio

Arkansas


KSOZ
KUAF
I
II
KASU
III
WEVL
WKNO
KABF
KUAR
KLRE
WNJC
WMAV
V
IV
KTXK
KBSA
WMAO
36N
35N
34N
33N
94W
93W
92W
91W
90W
0
50
100
150
200
250 MILES

Signal Coverage

▨ Primary (70 dBu)
Area: 14700. sq mi
Population: 1148000
Households: 407000

▨ Secondary (60 dBu)
Area: 23400. sq mi
Population: 1499000
Households: 532000

CALIFORNIA

Basic Statistics

Total State Population:	23,668,000	
Total Population Receiving Public Radio Signal:	22,826,000	(96%)
Total Population in Uncovered Areas:	842,000	

Public Radio Stations in State

Community	Call Letters
Arcata	KHSU-FM
Bakersfield	KPRX-FM
	KTQX-FM
Berkeley	KPFA-FM
Calexico	KUBO-FM
Chico	KCHO-FM
Chualar	KHDC-FM
Cupertino	KKUP-FM
Fresno	KFCF-FM
	KSJV-FM
	KVPR-FM
Garberville	KMUD-FM
Hoopa	KIDE-FM
Long Beach	KLON-FM
Los Angeles	KPFK-FM
	KUSC-FM
Mission Viejo	KSBR-FM
Modesto	KMPO-FM
Nevada City	KVMR-FM
Northridge	KCSN-FM
Pacific Grove	KAZU-FM
Pasadena	KPCC-FM
Philo	KZYX-FM
Sacramento	KXPR-FM
San Bernardino	KVCR-FM

Continued

Public Radio Stations (continued)

San Diego	KPBS-FM
San Francisco	KALW-FM
	KPOO-FM
	KQED-FM
San Luis Obispo	KCBX-FM
San Mateo	KCSM-FM
Santa Barbara	KSCA-FM
Santa Cruz	KUSP-FM
Santa Monica	KCRW-FM
Santa Rosa	KBBF-FM
Stockton	KUOP-FM
Thousand Oaks	KCPB-FM

General Comments

California is served by 37 public radio stations. Mountainous northern California is currently served by five stations. KSOR, Ashland, Oregon, has several translators in northern California. KHSU, Arcata, serves the coastal areas to Crescent City in the north and intends to extend service to Ft. Bragg to the south. KCHO, Chico, serves the Cascade Mountains and the northern Sacramento Valley. KIDE serves the Hoopa Valley Indian Reservation in northern Humboldt County and KMUD serves southern Humboldt County. KZYX is a new station under construction to serve Mendocino County.

The lower Sacramento River valley and the Sierra Nevada Mountains are served by KXPR, Sacramento, and KVMR, Nevada City.

Seven stations serve the San Francisco Bay area. KBBF in Santa Rosa serves the counties north of San Francisco Bay. KQED, KALW and KPOO are licensed to San Francisco, while KPFA operates across the Bay in Berkeley. KCSM, San Mateo, and KKUP, Cupertino, are located just south of San Francisco.

Three stations serve the Monterey area, KUSP, Santa Cruz, KHDC, in Chular, and KAZU, in Pacific Grove. KUSP has translators which extend that station's signal to the Big Sur area of the Pacific coast.

Further south along the coast, KCBX serves the San Luis Obispo area.

Service to the San Joaquin Valley is provided by KUOP, Stockton, and KSJV and KVPR in Fresno. KSJV and KVPR both have repeaters stations in Bakersfield, KTQX and KPRX. KSJV also has a repeater station, KMPO, in Modesto. Also serving Fresno is KFCF, which repeats the service of KPFA, Berkeley.

The Los Angeles metropolitan area is served by nine public radio stations. KPFK and KUSC are licensed to Los Angeles. Other stations serving the metropolitan area are KLON, Long Beach, KCSN, Northridge, KPCC, Pasadena, KVCR, San Bernardino, and KCRW, Santa Monica.

The terrain of the Los Angeles area includes the San Gabriel mountains to the north which results in many small areas without adequate signals. KCRW has several translators to serve Ventura County, including the communities of Ventura, Oxnard, Moorpark, Port Hueneme and Ojai. KUSC has a satellite station in Ventura County, KCPB, Thousand Oaks, and also a satellite station, KSCA, in Santa Barbara.

In the Palm Springs area, KCRW has a translator and KUSC is constructing a satellite station to provide local service.

Mission Viejo, to the south of the Los Angeles metropolitan area, is served by KSBR.

Southernmost California is served by KPBS, San Diego. KUBO, a satellite station of KSJV, Fresno, is under construction in Calexico, adjacent to the Mexican border. Approximately 1,000 people in the southeast corner of California receive AM radio service from Yuma, Arizona.

Uncovered Areas

Region I

The Coastal Mountains of northern California are very rugged. The unserved area is almost all national forest including Klamath, Six Rivers, Trinity, and Mendocino National Forests and the Marble Mountain Wilderness, Salmon-Trinity Alps Wilderness and the Yolla Bolly Middle Eel Wilderness area. KHSU, has plans to extend service via translator to Blue Lake and Willow Creek near Arcata and also extend service via translator south to Rio Dell, Garberville, Redway, Weott, and Ft. Bragg. Extension of service has been hampered by the lack of available frequencies in the area.

Region II

This area includes the rugged Cascade Mountains. Much of the unserved area is national forest, including Klamath, Shasta and Lassen National Forests. KSOR, Ashland, Oregon, plans to establish a repeater station at Mt. Shasta, while KCHO plans a repeater station in Redding and has a translator under construction in Alturas. This region contains an estimated 20 percent of the state's uncovered population.

Region III

This area includes the rugged Sierra Nevada Mountains. Much of the unserved area consists of national forest, including Eldorado, Stanislaus, Sierra and Inyo National Forests, the Emigrant Basin Wilderness and Yosemite National Park. Many communities in the foothills and valleys of these mountains receive spotty reception due to terrain. An estimated 60 percent of the state's uncovered population resides in this area.

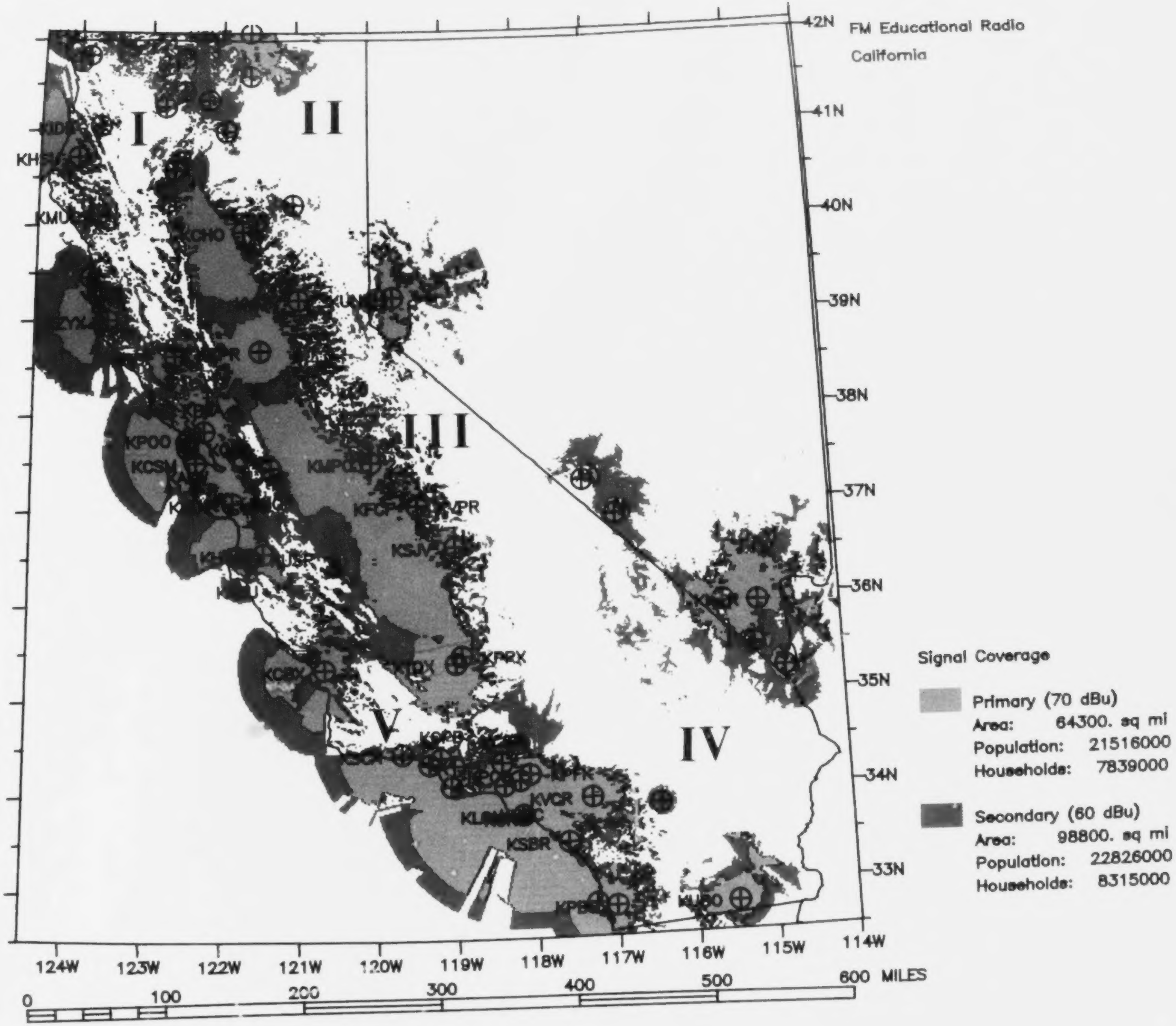
Region IV

This area is primarily desert, the most notable area being Death Valley National Monument. Broadcast signals from the Los Angeles area are blocked by the San Gabriel and San Bernardino Mountains. The high desert area around Victorville is growing and KVCR is planning to boost its signal to serve this area. Public radio is available in Barstow via a KCRW translator. The population in the remainder of this area is very low and widely dispersed. The scarcity of water limits the region's growth potential.

Region V

This area consists of the Sierra Madre Mountains which effectively block radio signals and is primarily the Los Padres National Forest which is sparsely populated.

FM Educational Radio
California



I
II
III
IV
V
KIDE
KHSU
KMU
KCHO
KZYX
KUNR
KPOO
KCSM
KMPO
KFCF
KVPR
KSJV
KUSP
KCBX
KPRX
KVCR
KPFK
KSBR
KPBS
KUBO
42N
41N
40N
39N
38N
37N
36N
35N
34N
33N
124W
123W
122W
121W
120W
119W
118W
117W
116W
115W
114W
0
100
200
300
400
500
600 MILES

Signal Coverage

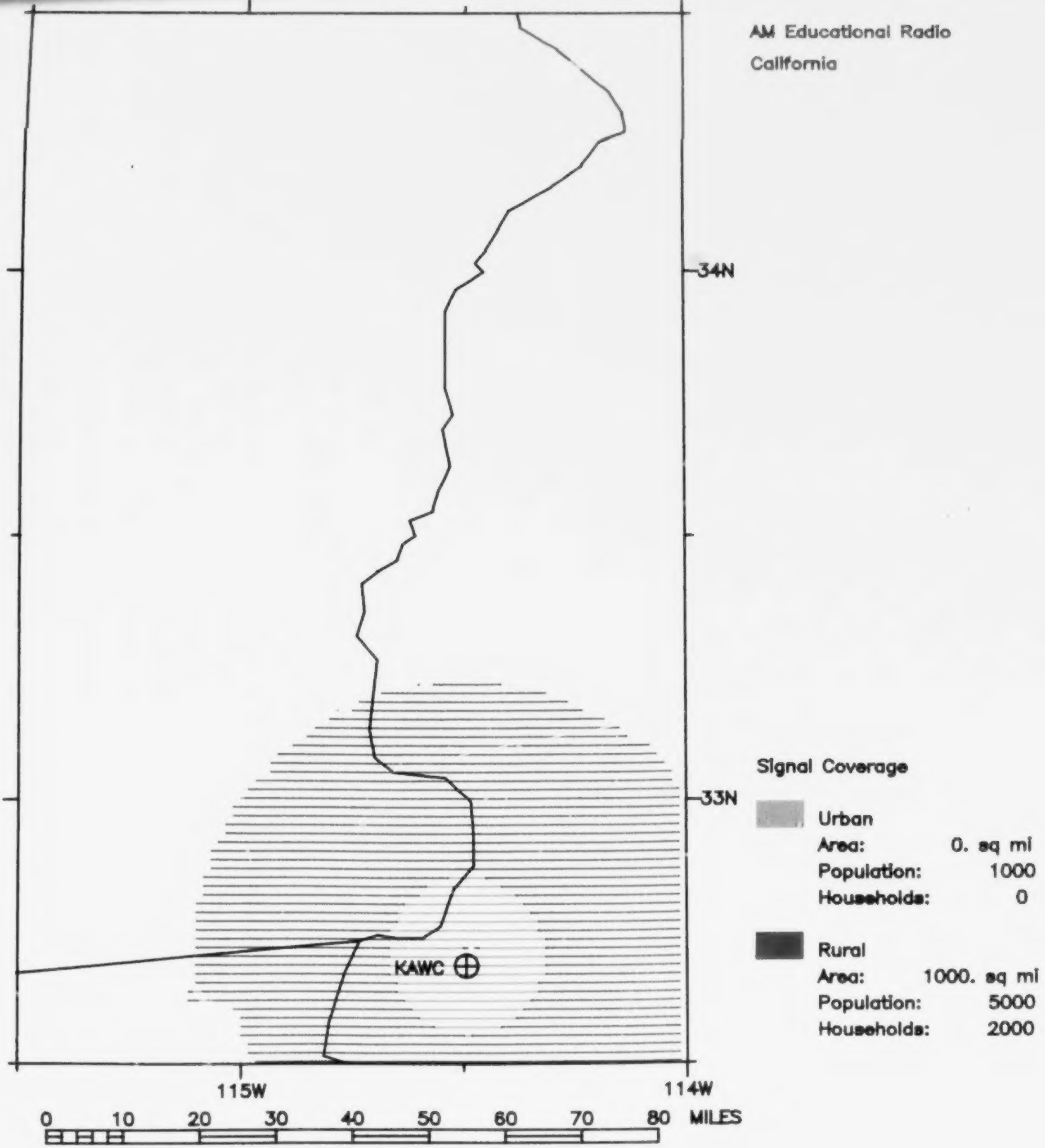
▨ Primary (70 dBu)

Area:	64300. sq mi
Population:	21516000
Households:	7839000

■ Secondary (60 dBu)

Area:	98800. sq mi
Population:	22826000
Households:	8315000

AM Educational Radio
California


34N
33N
115W
114W
KAWC
0
10
20
30
40
50
60
70
80
MILES
Signal Coverage
Urban
Area: 0. sq mi
Population: 1000
Households: 0
Rural
Area: 1000. sq mi
Population: 5000
Households: 2000

COLORADO

Basic Statistics

Total State Population:	2,890,000
Total of Population Receiving Public Radio Signal:	2,550,000 (88%)
Total of Population in Uncovered Areas:	340,000

Public Radio Stations in State

Community	Call Letters
Alamosa	KRZA-FM
Aspen	KAJX-FM
Boulder	KGNU-FM
Carbondale	KDNK-FM
Colorado Springs	KRCC-FM
Crested Butte	KBUT-FM
Denver	KCFR-FM
	KUVO-FM
Fort Collins	KCSU-FM
Grand Junction	KPRN-FM
Greeley	KUNC-FM
Gunnison	KWSB-FM
Ignacio	KSUT-FM
Paonia	KVNF-FM
Telluride	KOTO-FM

General Comments

Because of the mountains, a good part of Colorado's population has historically depended upon translators for both TV and FM service. The primary population centers in the state -- Denver, Colorado Springs, Pueblo, Boulder, Fort Collins and Greeley -- are located along the "Front Range" on the eastern slope of the Rocky Mountains. The balance of the state is either flat (eastern section) with vast distances between small population centers or mountainous, with sparsely populated areas between mountain ranges and national forests (western slope).

Uncovered Areas

Region I

Most of the southeastern corner of Colorado consists of flat land with few small towns over 8,000 in population (Lamar, Las Animas, La Junta, Rocky Ford). The area has three problems which inhibit public radio service to the area: 1) large land area with low-density population, 2) great distance from other national public radio outlets (for purposes of translator service) and 3) an inability to financially support radio translator service to the area.

Region II

This area includes the San Juan and Rio Grande National Forests and the Continental Divide. Virtually every population center which adjoins these areas has a community-licensed FM station or county-supported translator providing public radio service.

Region III

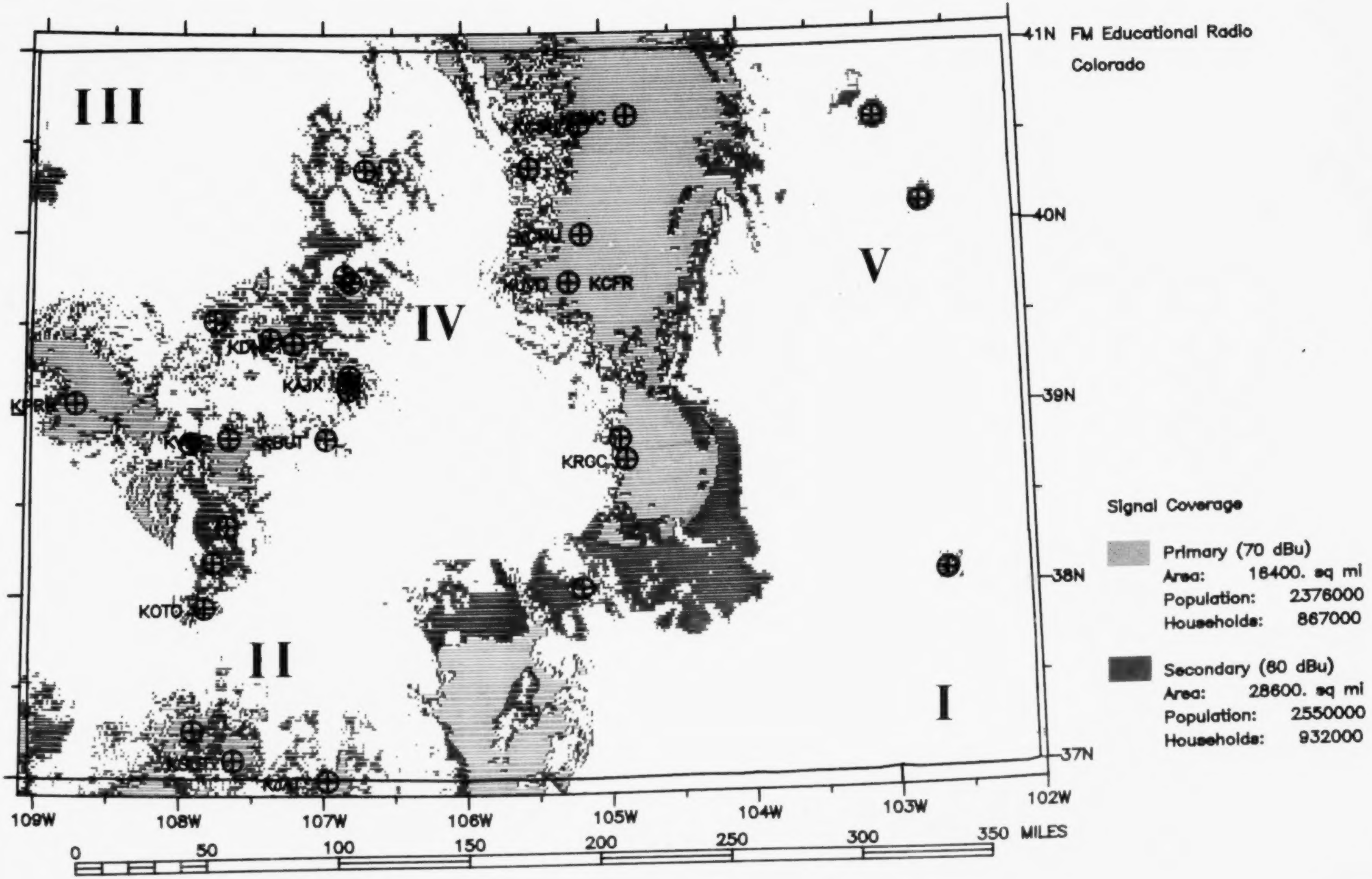
The largest city in this northwest corner of the state is Craig with a population of 8,000. Although the region is largely unpopulated, it contains a few widely dispersed, small communities such as Dinosaur with a population of 313. Translators would appear to be the most reasonable technology for serving some of these very small communities. The terrain and vast distances between communities and from existing signals, as well as the lack of a strong financial base, however, make this an unlikely possibility. This region contains an estimated 45 percent of Colorado's uncovered population.

Region IV

The mountainous Continental Divide dominates this portion of the state. Included in this area are numerous national parks and national forests. The entire region is sparsely populated. Each community of greater than 1,000 people is served via translator from stations along the Front Range.

Region V

Population centers are widely dispersed in this northeast region of the state, and are generally very small. The towns of Sterling and Yuma, two of the larger communities, are presently served by translators from Greeley, Colorado. It is questionable whether the sparse populations in the remaining communities can provide sufficient financial support for translator service.


FM Educational Radio
Colorado

Signal Coverage
▨ Primary (70 dBu)
Area: 16400. sq mi
Population: 2376000
Households: 867000
■ Secondary (60 dBu)
Area: 28600. sq mi
Population: 2550000
Households: 932000
I
II
III
IV
V
KCFR
KUVO
KRCC
KAJX
KBUT
KOTO
41N
40N
39N
38N
37N
109W
108W
107W
106W
105W
104W
103W
102W
0
50
100
150
200
250
300
350 MILES

CONNECTICUT

Basic Statistics

Total State Population:	3,108,000
Total Population Receiving Public Radio Signal:	3,047,000 (98%)
Total Population in Uncovered Areas:	61,000

Public Radio Stations in State

Community	Call Letters
Fairfield	WSHU-FM
Middlefield	WPKT-FM
Monroe	WMNR-FM
Norwich	WNPR-FM
Stamford	WEDW-FM
West Haven	WNHU-FM

General Comments

Public radio is provided by a variety of Connecticut educational institutions and by the Connecticut Educational Telecommunications Corporation (CETC). The majority of state residents receive a public radio signal. Two mountainous areas, however, have spotty public radio signals.

Uncovered Areas

Region I

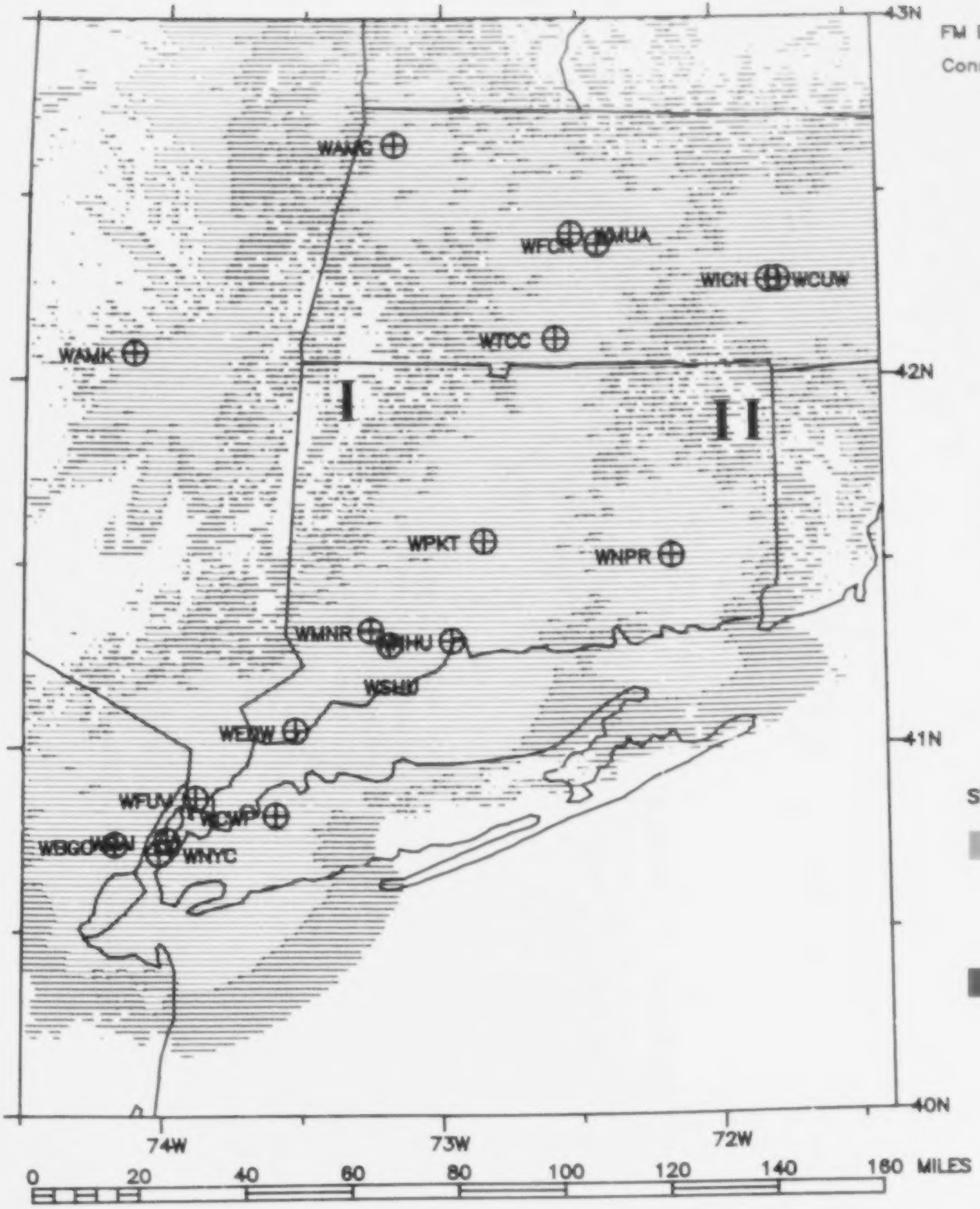
In 1980, CETC was prepared to construct a 1 kw repeater transmitter that would have provided service to Region I. The construction permit was returned to the FCC, however, in 1984. It had been based upon an antenna site location controlled by the State Police who later refused CETC use of their tower. Service is possible if an acceptable antenna site could be located.

Region II

CETC has researched possible ways of providing service to Region II and has found that there are no frequencies available at reasonable power. It may be possible to bring in translators to cover some parts of the area.

FM Educational Radio

Connecticut


43N
42N
41N
40N
74W
73W
72W
WAMC
WFCR
WMUA
WICN
WCUW
WTCC
WAMK
I
II
WPKT
WNPR
WMNR
WSHU
WSHU
WEDW
WFUV
WCWP
WBGO
WNYC
0
20
40
60
80
100
120
140
160 MILES

Signal Coverage

▨ Primary (70 dBu)

Area:	4600. sq mi
Population:	2878000
Households:	1012000

■ Secondary (60 dBu)

Area:	5400. sq mi
Population:	3047000
Households:	1073000

DELAWARE

Basic Statistics

Total State Population:	594,000
Total Population Receiving Public Radio Signal:	500,000 (84%)
Total Population in Uncovered Areas:	94,000

Public Radio Stations in State

Community	Call Letters
NONE	

General Comments

Delaware has no public radio stations as defined in this study. The southern part of the state receives a signal from WSCL-FM, a Maryland licensee with an antenna mounted on a tower in Seaford, Delaware. The northern part of the state receives some signals from the public radio stations in Philadelphia. There is no active public telecommunications agency in Delaware.

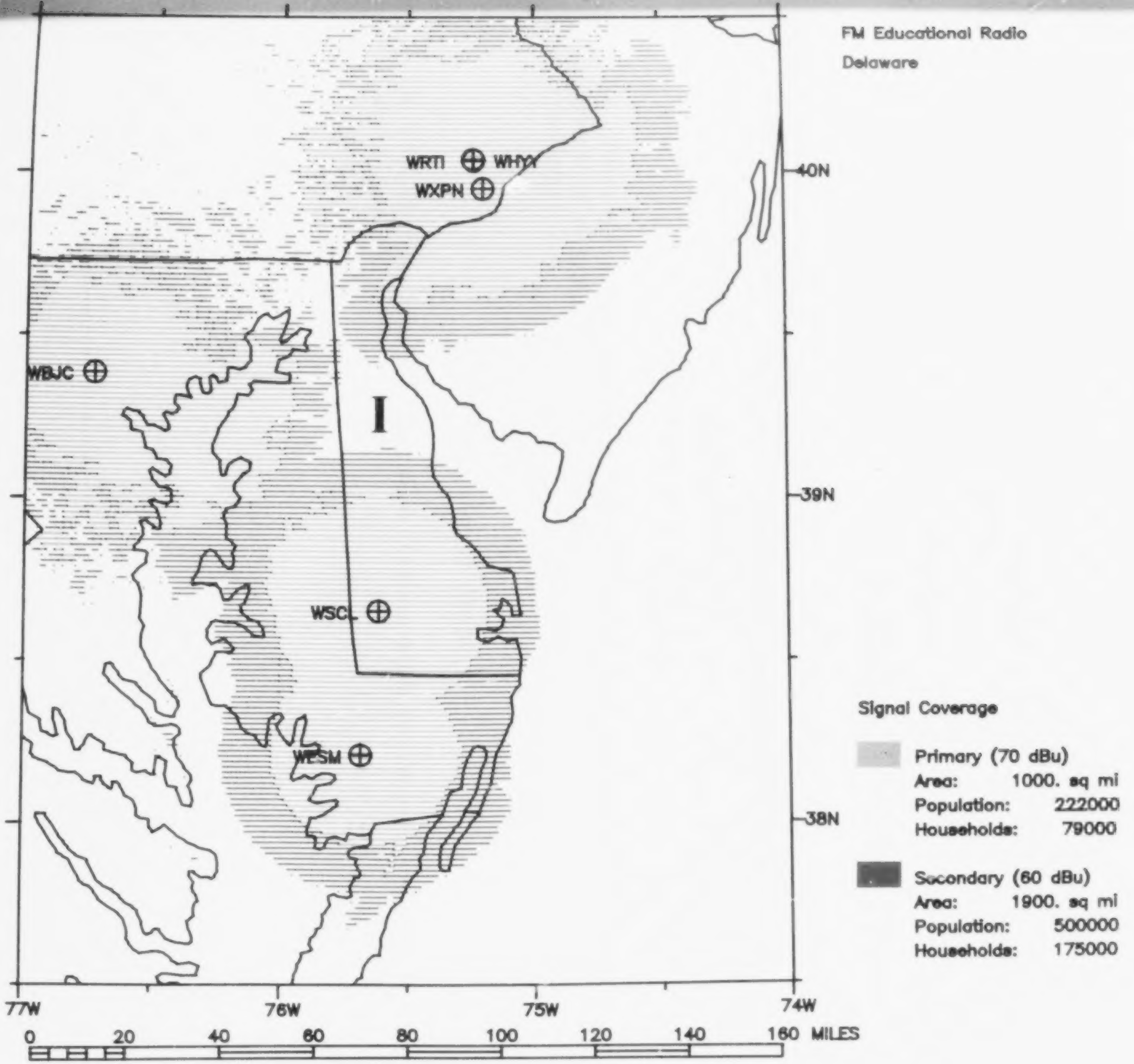
Uncovered Areas

Region I

Although NTIA has had inquiries, primarily from technical and junior colleges, no applications have been received for activation of a public radio station. Although Region I, by the criteria used in this study, is considered uncovered, public radio signals below a 60 dBu level are received in this area. This, combined with the rural nature of the area, likely contributes to the lack of public radio as defined in this study. If there are no technical prohibitions, it is conceivable that translators could bring coverage to the "white area" from Philadelphia or from WSCL-FM.

FM Educational Radio

Delaware


WRTI
WHYY
WXPN
WBJC
I
WSCL
WESM
40N
39N
38N
77W
76W
75W
74W
0
20
40
60
80
100
120
140
160 MILES

Signal Coverage

▨ Primary (70 dBu)
Area: 1000. sq mi
Population: 222000
Households: 79000

■ Secondary (60 dBu)
Area: 1900. sq mi
Population: 500000
Households: 175000

DISTRICT OF COLUMBIA

Basic Statistics

Total State Population:	638,000
Total Population Receiving Public Radio Signal:	638,000 (100%)
Total Population in Uncovered Areas:	0

Public Radio Stations in State

Community	Call Letters
Washington, DC	WAMU-FM WETA-FM WPFW-FM

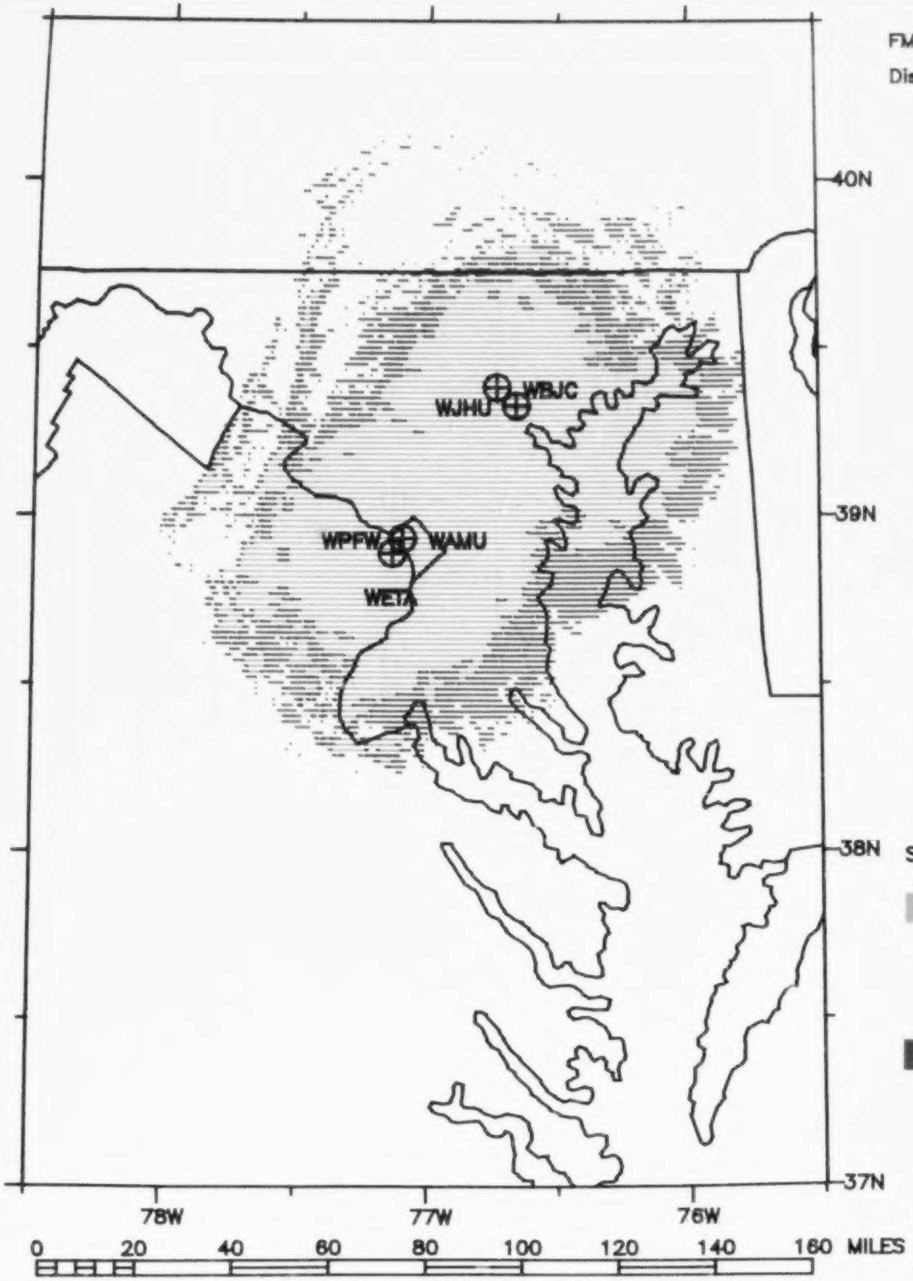
General Comments

The District of Columbia is completely covered by public radio signals from local stations. Public radio is provided by both university-based licensees and nonprofit community organizations.

Uncovered Areas

There are no areas within the District of Columbia which do not receive at least one public radio signal.

FM Educational Radio
District of Columbia



40N
39N
38N
37N
78W
77W
76W
WJHU
WBJC
WPFW
WAMU
WETA
0
20
40
60
80
100
120
140
160 MILES

Signal Coverage

▨ Primary (70 dBu)
Area: 100. sq mi
Population: 638000
Households: 253000

■ Secondary (60 dBu)
Area: 100. sq mi
Population: 638000
Households: 253000

FLORIDA

Basic Statistics

Total State Population:	9,746,000
Total Population Receiving Public Radio Signal:	9,111,000 (93%)
Total Population in Uncovered Areas:	635,000

Public Radio Stations in State

Community	Call Letters
Fort Myers	WSFP-FM
Fort Pierce	WQCS-FM
Gainesville	WUFT-FM
Jacksonville	WJCT-FM
Miami	WDNA-FM
	WLRN-FM
Orlando	WMFE-FM
Panama City	WKGC-FM
	WKGC-AM
Pensacola	WUWF-FM
Tallahassee	WFSU-FM
Tampa	WMNF-FM
	WUSF-FM
West Palm Beach	WXEL-FM

General Comments

Florida residents receive public radio coverage from a variety of public stations licensed to educational institutions and community-based nonprofit organizations. There is no state public radio network in Florida. In addition to the FM public radio stations that provide service to the state, WKGC-AM, licensed to the Gulf Coast Community College in Pensacola, also provides a public signal.

Uncovered Areas

Of the four regions that do not receive a public radio signal, Regions III and IV contain an estimated 60 percent and 30 percent respectively, of the uncovered population.

Region I

Region I is the area southwest of Tallahassee and southeast of Panama City. Much of this area is within the Apalachicola National Forest. Service to this area could be provided by a series of radio translators as population concentrations dictate.

Region II

This is the area east of the Tallahassee market that currently does not receive a public radio signal. Florida State University has applied to the FCC to construct a second station which should provide coverage to much of this unserved area.

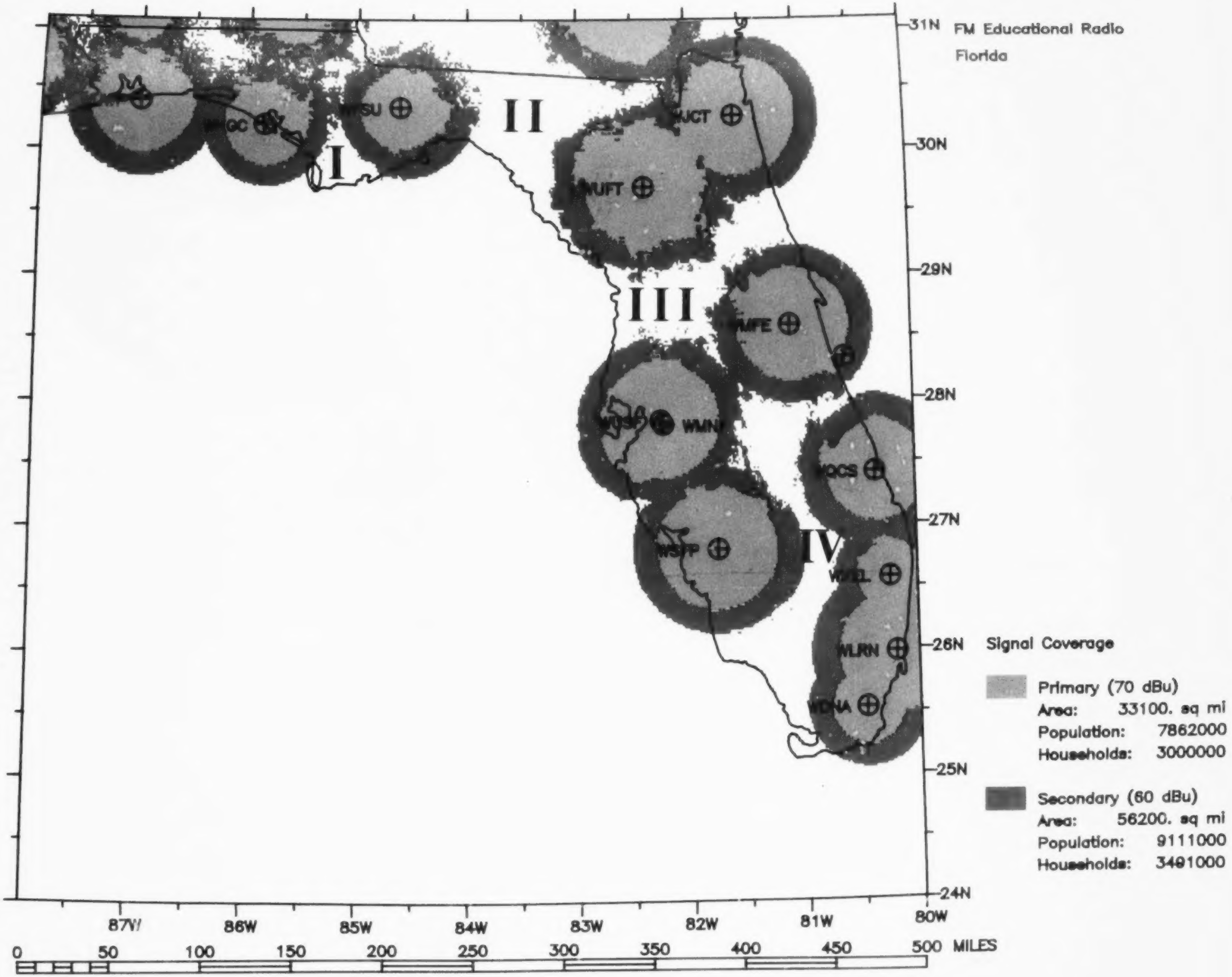
Region III

Region III is the uncovered region south of the Gainesville and Jacksonville signals and north of the Orlando and Tampa coverages. A repeater/satellite station or a series of translator facilities could eliminate these unserved areas.

Region IV

This area consists of the south-central inland part of the state and the southwestern Gulf Coast region beginning south of Naples. This region (with some exceptions, two of which are discussed below) is rather low in population density. The Sebring/Avon Park area appears to be large enough to support at least a repeater/satellite station while it is doubtful if there is adequate population in the extreme southern Gulf Coast to support the construction and operation of a full-powered station. A series of much less expensive public radio translators, limited to communities with significant population densities, may be a more appropriate alternative.

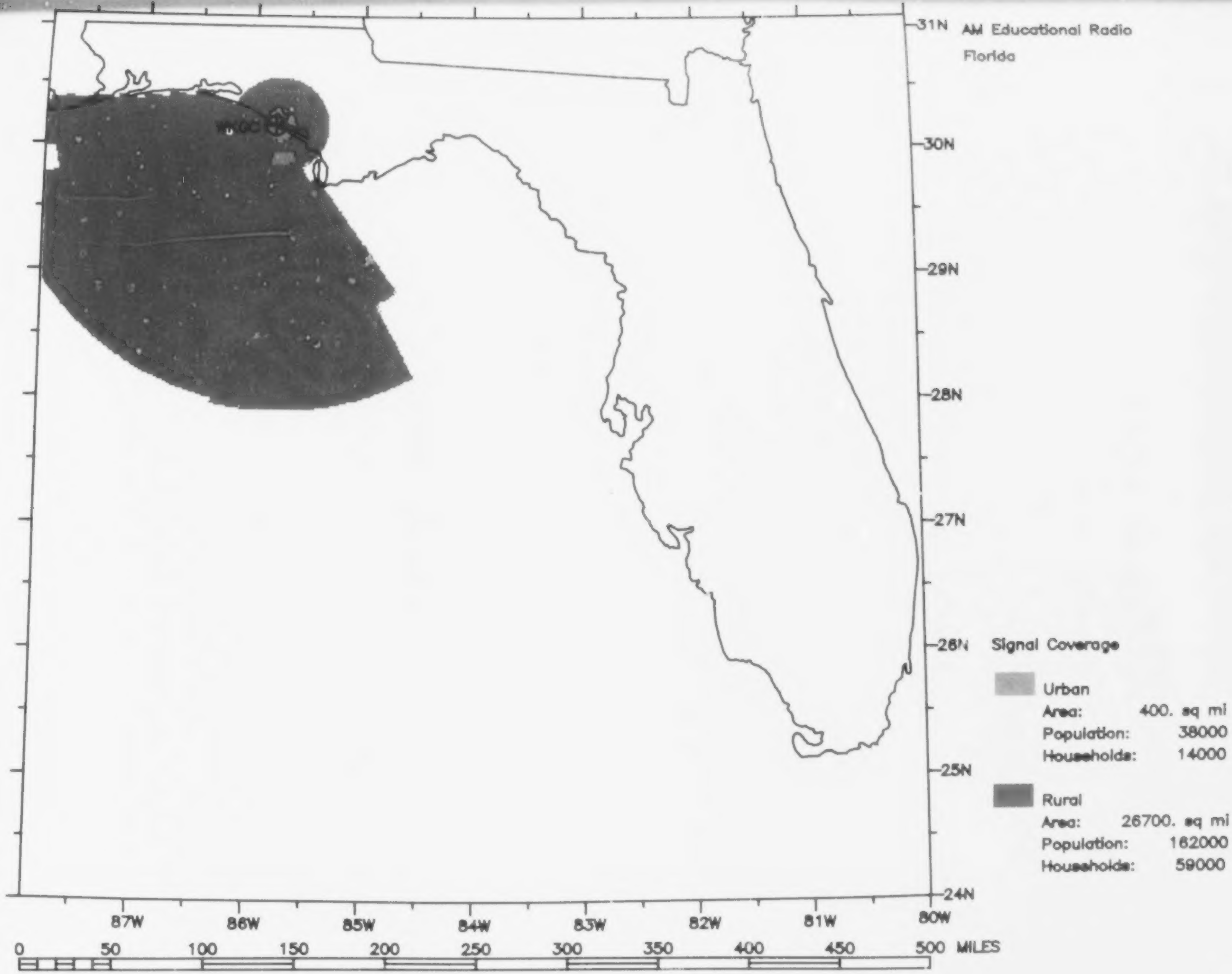
FM Educational Radio
Florida



I
II
III
IV
WKGC
WFSU
WJCT
WUFT
WMFE
WUSF
WMNF
WQCS
WSFP
WXEL
WLRN
WDNA
31N
30N
29N
28N
27N
26N
25N
24N
87W
86W
85W
84W
83W
82W
81W
80W
0
50
100
150
200
250
300
350
400
450
500 MILES
Signal Coverage
Primary (70 dBu)
Area: 33100. sq mi
Population: 7862000
Households: 3000000
Secondary (60 dBu)
Area: 56200. sq mi
Population: 9111000
Households: 3491000

AM Educational Radio

Florida


WKGC
31N
30N
29N
28N
27N
26N
25N
24N
87W
86W
85W
84W
83W
82W
81W
80W
0
50
100
150
200
250
300
350
400
450
500 MILES

Signal Coverage

▨ Urban
Area: 400. sq mi
Population: 38000
Households: 14000

■ Rural
Area: 26700. sq mi
Population: 162000
Households: 59000

GEORGIA

Basic Statistics

Total State Population:	5,463,000
Total Population Receiving Public Radio Signal:	4,426,000 (81%)
Total Population in Uncovered Areas:	1,037,000

Public Radio Stations in State

Community	Call Letters
Athens	WUGA-FM
Atlanta	WABE-FM WCLK-FM WRKG-FM
Augusta	WACG-FM
Carrollton	WWGC-FM
Cochran	WDCO-FM
Columbus	WTJB-FM (Licensed to Troy State Univ., AL)
Savannah	WSVH-FM
Tifton	WPLH-FM
Warm Springs	WJSP-FM
Waycross	WXVS-FM

General Comments

The majority of the residents of Georgia receive a public radio signal from the state-supported public radio network (licensed to the Georgia Public Telecommunications Commission), educational institutions and organizations in addition to several nonprofit community-based organizations. Public radio signals from the adjoining states of Alabama, Florida, South Carolina and Tennessee also are received.

Uncovered Areas

During the 1980s, the Georgia Public Telecommunications Commission began a PTFP-assisted mission to provide a public radio signal to the maximum number of residents of the state. As a result of the network's efforts, several public stations have been added to the network. Providing coverage to unserved areas of the state remains one of the GPTC's high priorities.

Two uncovered areas -- Region I, the southwestern corner of the state, and Region IV, the semi-circular area to the west of Augusta -- are both within potential channel 6 interference contours. Obviously, any additional service proposed for these two areas must comply with the restrictions appropriate for a channel 6 interference area.

Region I

The GPTC was recently awarded an FCC construction permit for a new public radio station in Albany. This proposed station will serve a previously uncovered population in Region I. This region contains approximately 45 percent of Georgia's unserved population.

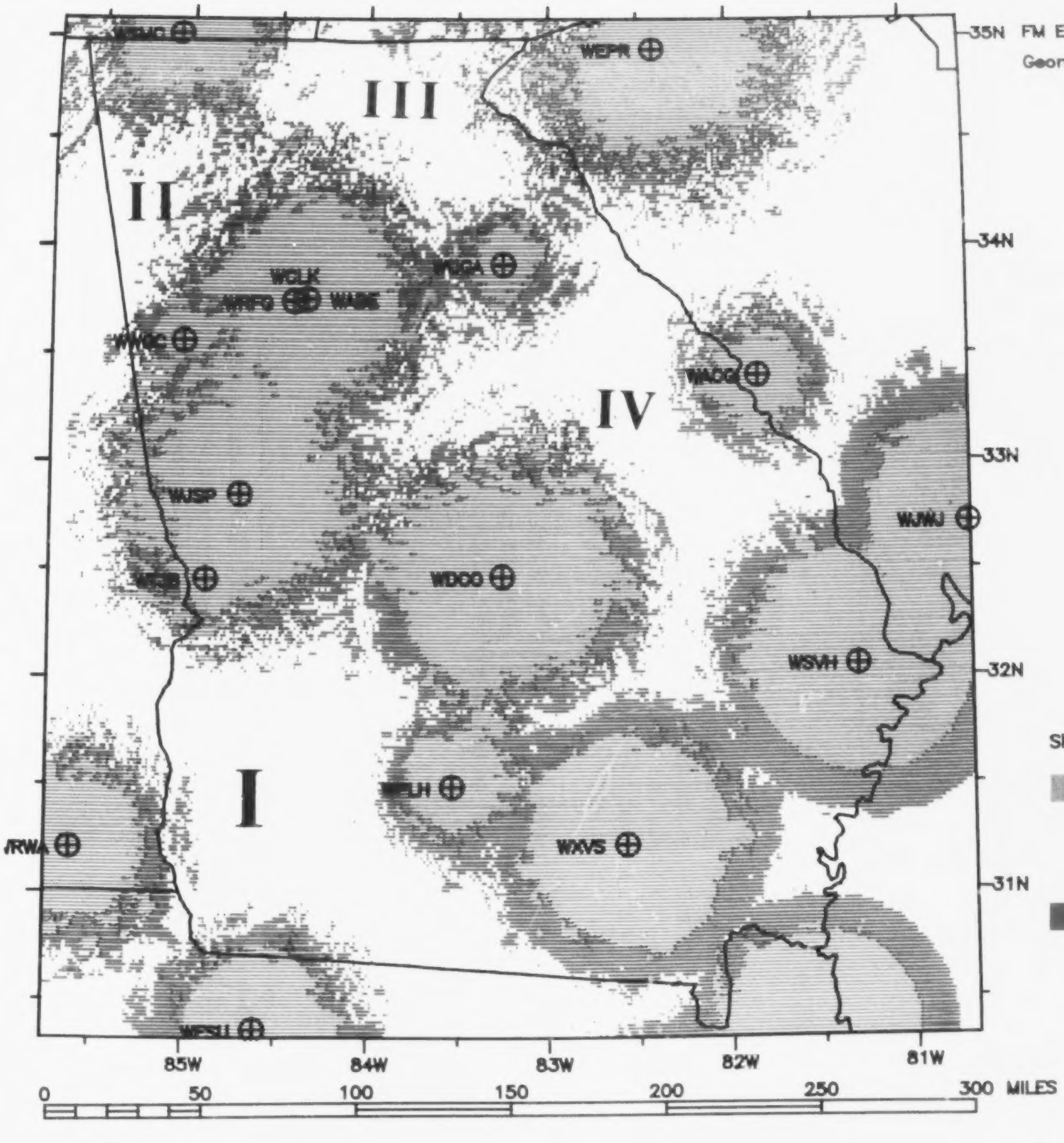
Regions II and III

The other two unserved regions -- Region II, the area northwest of Atlanta, and Region III, the uncovered area northeast of Atlanta and northwest of Athens -- contain an estimated 45 percent of the state's uncovered population. Coverage in these regions is influenced by the location of the Chattahoochee National Forest and the mountainous terrain common to the area. The construction of radio translators and/or repeater/satellite stations may be the best means of providing an economically viable service in Regions II and III.

Region IV

The new Aiken, SC station, licensed to the South Carolina Educational Television Commission, will provide additional service to parts of this region. The scheduled on-air date for the station is April 1989. Region IV also includes an uncovered area to the north of WDCO-FM. This area extends into the Oconee National Forest and appears to include the uncovered areas north of Macon. At least one community-based group has expressed interest in establishing a public radio station in the Macon market. This should provide improved coverage to the area north of Macon.

FM Educational Radio
Georgia



WSMC
WEPR
III
II
WCLK
WRFG
WABE
WUGA
WWGC
WACG
IV
WJSP
WJWJ
WDCO
WSVH
I
WXVS
RWA
WFSU
35N
34N
33N
32N
31N
85W
84W
83W
82W
81W
0
50
100
150
200
250
300 MILES

Signal Coverage

▨ Primary (70 dBu)
Area: 25300. sq mi
Population: 3760000
Households: 1297000

■ Secondary (60 dBu)
Area: 39500. sq mi
Population: 4428000
Households: 1520000

HAWAII

Basic Statistics

Total State Population:	965,000
Total Population Receiving Public Radio Signal:	871,000 (90%)
Total Population in Uncovered Areas:	94,000

Public Radio Stations in State

Community	Call Letters
Honolulu	KHPR-FM
Maui	KKUA-FM

General Comments

Hawaii Public Radio provides service to Hawaii from its main station in Honolulu, with a repeater station on the island of Maui. Hawaii Public Radio also operates a translator in the Waianae Mountains to serve the western portion of the island of Oahu. The Hawaiian islands are volcanic in origin, and each island has mountain peaks which block signals from reaching portions of the islands.

These facilities provide service to the islands of Oahu, Maui, Molokai and Lanai. The station on Maui also provides coverage to much of the western side of the island of Hawaii and the northeastern part of the island of Hawaii up to Hilo.

Uncovered Areas

Region I

The distance between the islands of Oahu, where the main KHPR transmitter is located, and the island of Kauai is so great that KHPR signals cannot reach Kauai. The island of Kauai therefore receives no public radio service. Hawaii Public Radio has applied to this agency for placement of a microwave-fed repeater to cover this area.

Region II

The western side of Maui has poor coverage near Lahaina and the communities of the Kaanapali coast. This area is beyond the service area of KHPR, Oahu, and is blocked by mountains from receiving direct service from KKUA.

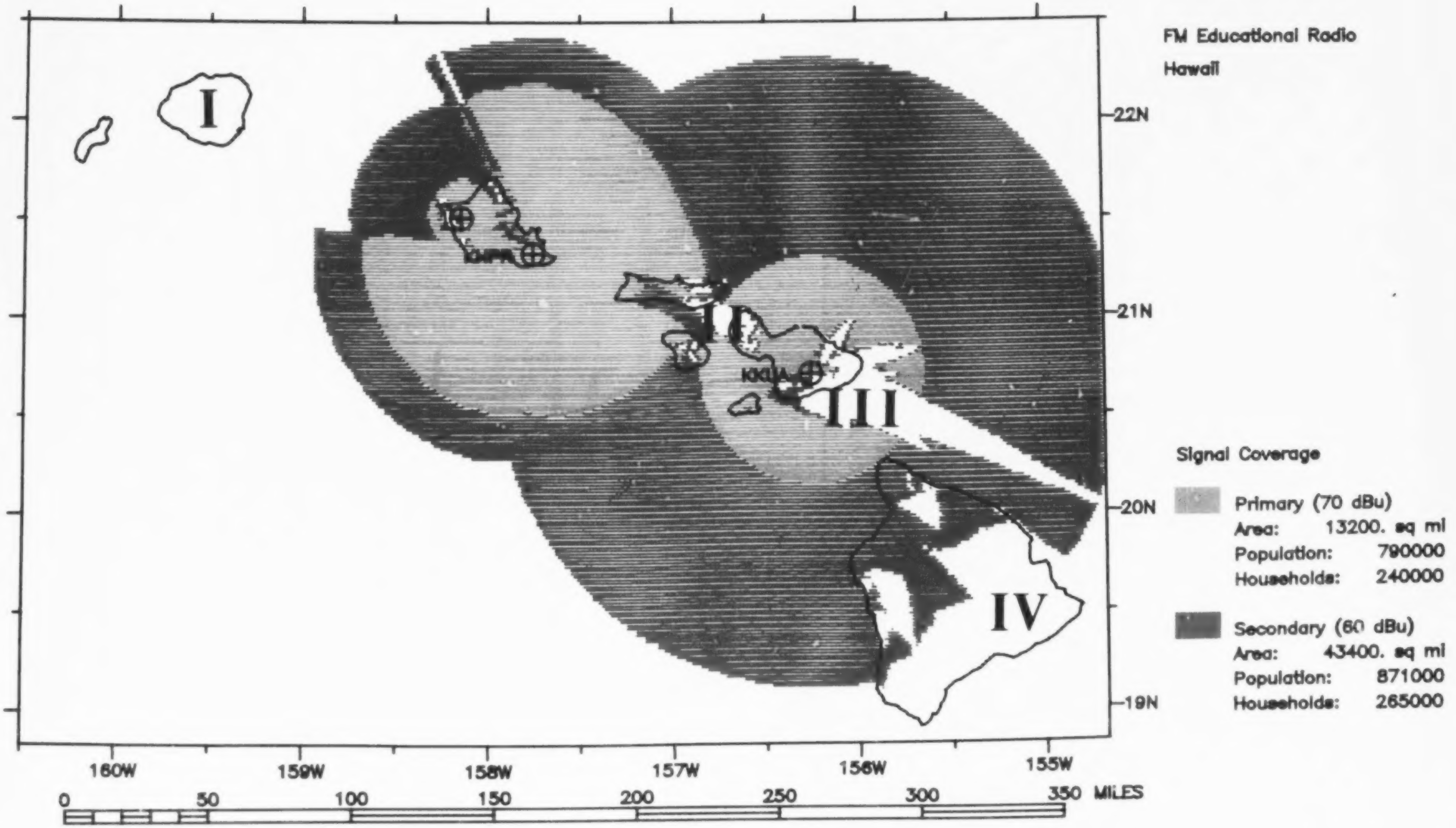
Region III

The community of Hana on the eastern coast of Maui is without service. Service from KKUA is blocked from this region by Mt. Haleakala. Only a few hundred people live in this unserved region. Given the small population, a translator would provide the most cost-effective means of coverage.

Region IV

Much of the western side of the island of Hawaii is served from KKUA, Maui. The mountains of the island of Hawaii block the KKUA signal from significant areas. The island of Hawaii has uncovered areas near the community of Hilo on the eastern side of the island. The Waimea area of the western side of the island of Hawaii is not covered. Hawaii Public Radio has applied to this agency for a microwave-fed repeater to serve Hilo.

Hawaii Public Radio has plans to improve coverage in the narrow valleys of eastern Oahu island by relocating the KHPR transmitter to the Waianae Mountains. Increasing the power of KKUA, Maui will strengthen the signal on the east coast of the island of Oahu.



FM Educational Radio

Hawaii

I
II
III
IV
KHPR
KKUA
22N
21N
20N
19N
160W
159W
158W
157W
156W
155W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Primary (70 dBu)
Area: 13200. sq mi
Population: 790000
Households: 240000
Secondary (60 dBu)
Area: 43400. sq mi
Population: 871000
Households: 265000

IDAHO

Basic Statistics

Total State Population:	944,000
Total Population Receiving Public Radio Signal:	487,000 (52%)
Total Population in Uncovered Areas:	457,000

Public Radio Stations in State

Community	Call Letters
Boise	KBSU-FM
Moscow	KRFA-FM

General Comments

Idaho is one of the most mountainous areas in the Rocky Mountain region. Part of its eastern border is the Continental Divide. For this reason, the vast majority of the state receives its television and radio signals via translator. This is the case for both commercial and public signals.

Public broadcast coverage in the state has been addressed by Boise State University (radio) and the State Board of Education (television). They are involved in a number of integrated projects which will expand public broadcast service statewide.

The first such project was the creation of a microwave "backbone" system which interconnects Idaho's three public television stations, which are located in Boise, Pocatello, and Moscow, the three largest metropolitan areas. This system would eventually be able to interconnect public radio services to the same communities.

The second project was the funding of twenty-eight TV translators which are rebroadcasting the signals of the three primary public television stations. This initial site work became integral to future telecommunications planning.

Third, Boise State University (KBSU-FM) has begun the process of expanding its signal via translator. This will be accomplished more effectively because the identification of communities to receive services and site development for the television translator system, upon which radio development will piggyback, has been completed.

Uncovered Areas

Region I

This area includes the three largest national forests in the state, Clearwater, Nez Perce, and Payette. Areas adjacent to the "white space" receive public radio signals from Washington, KRFA-FM, and Montana, KUFM-FM. The towns in the center of the national forests are very remote and generally have fewer than 300 people. Perhaps 70,000 people live scattered throughout the region. Due to the low population density, development of service to these areas may be impractical.

Region II

The area near the Canadian border north of the community of Coeur d'Alene is composed almost entirely of the Kaniksu National Forest. The largest town in the area is Sandpoint, population 4,460. At present, because of the lack of economic resources, the state system has no plans to extend signal to this area.

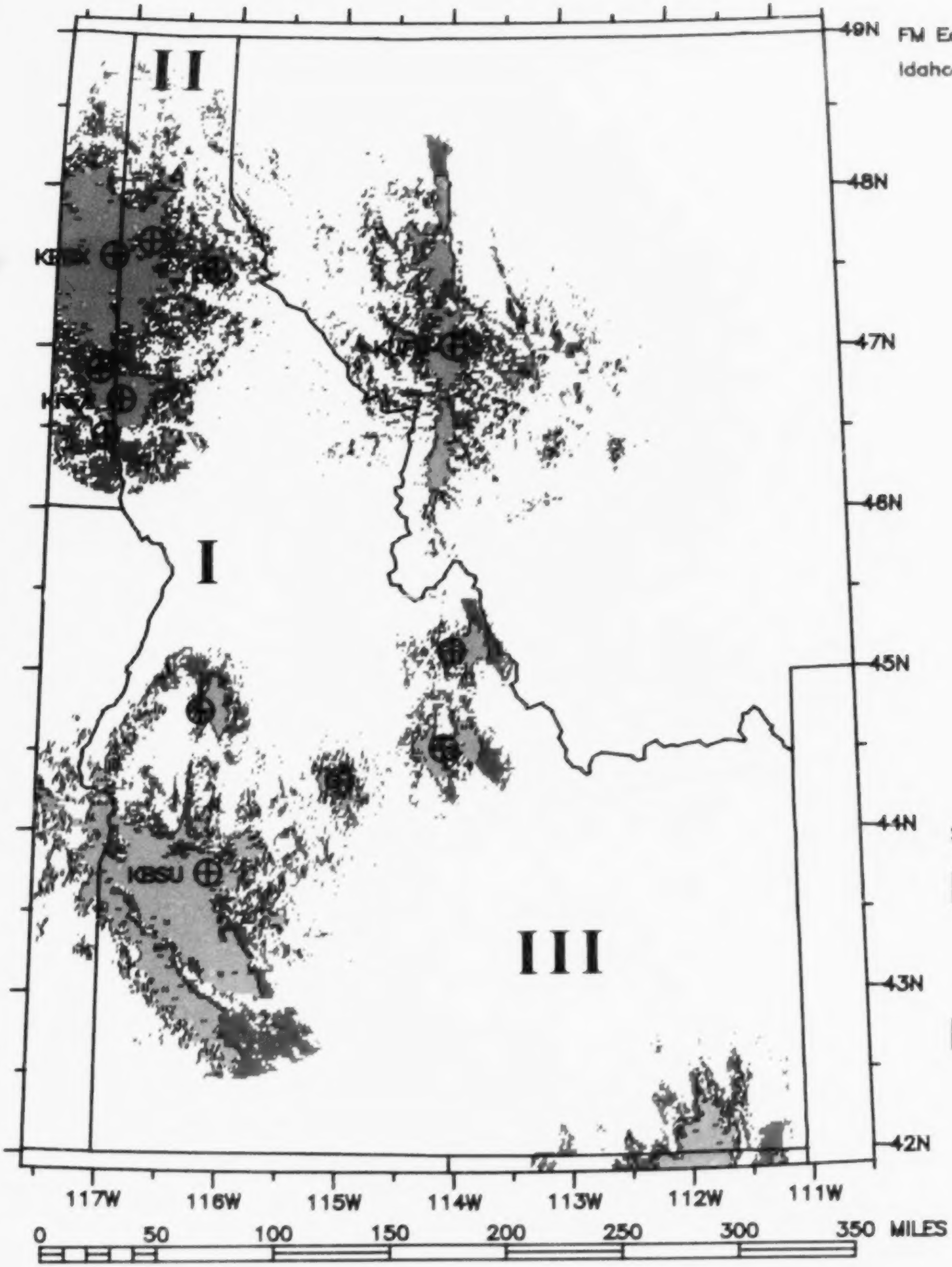
Region III

This area includes several national forests and parks. An estimated 350,000 persons reside in this region. KBSU-FM hopes to serve the larger population centers in the Sun Valley/Ketchum/Hailey area as part of its next signal expansion. Translators would be the most likely technology used to provide service to the numerous small towns in this region.

The Pocatello-Idaho Falls area presently receives a signal from the Rexburg College station, KRIC-FM. KRIC was not included in this study, but does carry NPR programming.

FM Educational Radio

Idaho


II
I
III
KBSU
49N
48N
47N
46N
45N
44N
43N
42N
117W
116W
115W
114W
113W
112W
111W
0
50
100
150
200
250
300
350 MILES

Signal Coverage

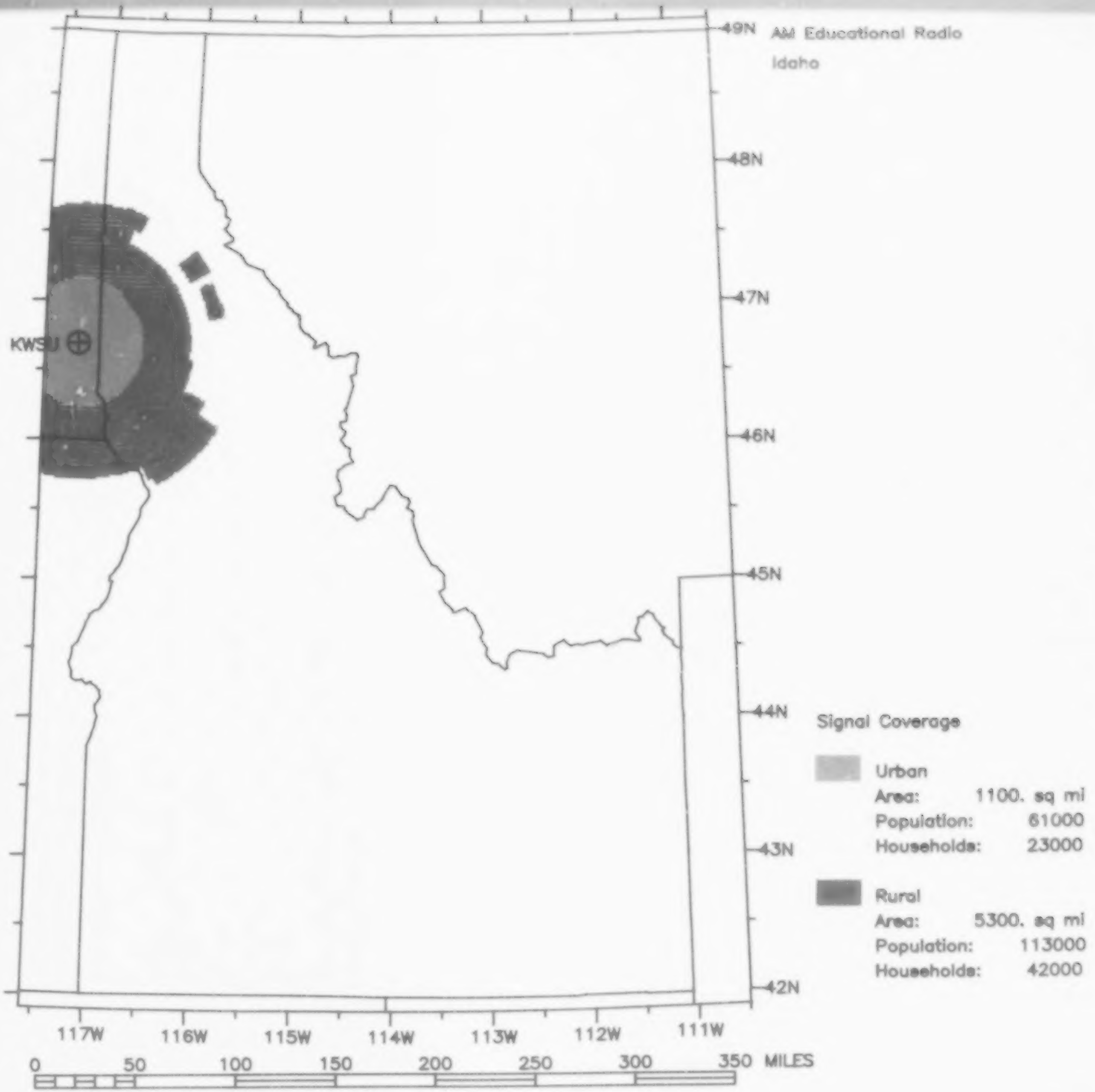
▨ Primary (70 dBu)

Area:	10300. sq mi
Population:	425000
Households:	149000

▨ Secondary (60 dBu)

Area:	16000. sq mi
Population:	487000
Households:	172000

AM Educational Radio
Idaho


49N
48N
47N
46N
45N
44N
43N
42N
KWSU
117W
116W
115W
114W
113W
112W
111W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Urban
Area: 1100. sq mi
Population: 61000
Households: 23000
Rural
Area: 5300. sq mi
Population: 113000
Households: 42000

ILLINOIS

Basic Statistics

Total State Population:	11,427,000
Total Population Receiving Public Radio Signal:	9,746,000 (85%)
Total Population in Uncovered Areas:	1,681,000

Public Radio Stations in State

Community	Call Letters
Carbondale	WSIU-FM
Champaign	WEFT-FM
Chicago	WBEZ-FM
Dekalb	WNIU-FM
Edwardsville	WSIE-FM
Glen Ellyn	WDCB-FM
Macomb	WIUM-FM
Normal	WGLT-FM
Peoria	WCBU-FM
Rock Island	WVIK-FM
Springfield	WSSR-FM
Urbana	WILL-FM WILL-AM

General Comments

The majority of Illinois residents receive a public radio signal, although there are significant unserved areas. There is no state-designated entity responsible for the development of public radio.

Uncovered Areas

Regions II and III contain an estimated 40 percent and 35 percent respectively, of Illinois' unserved population

Region I

Region I, a rural section in the northwest corner of the state, is uncovered for indeterminate reasons. Translators are impractical because of the size of the land mass to be covered. The stronger power of a full-service station or a repeater station could cover the area.

Region II

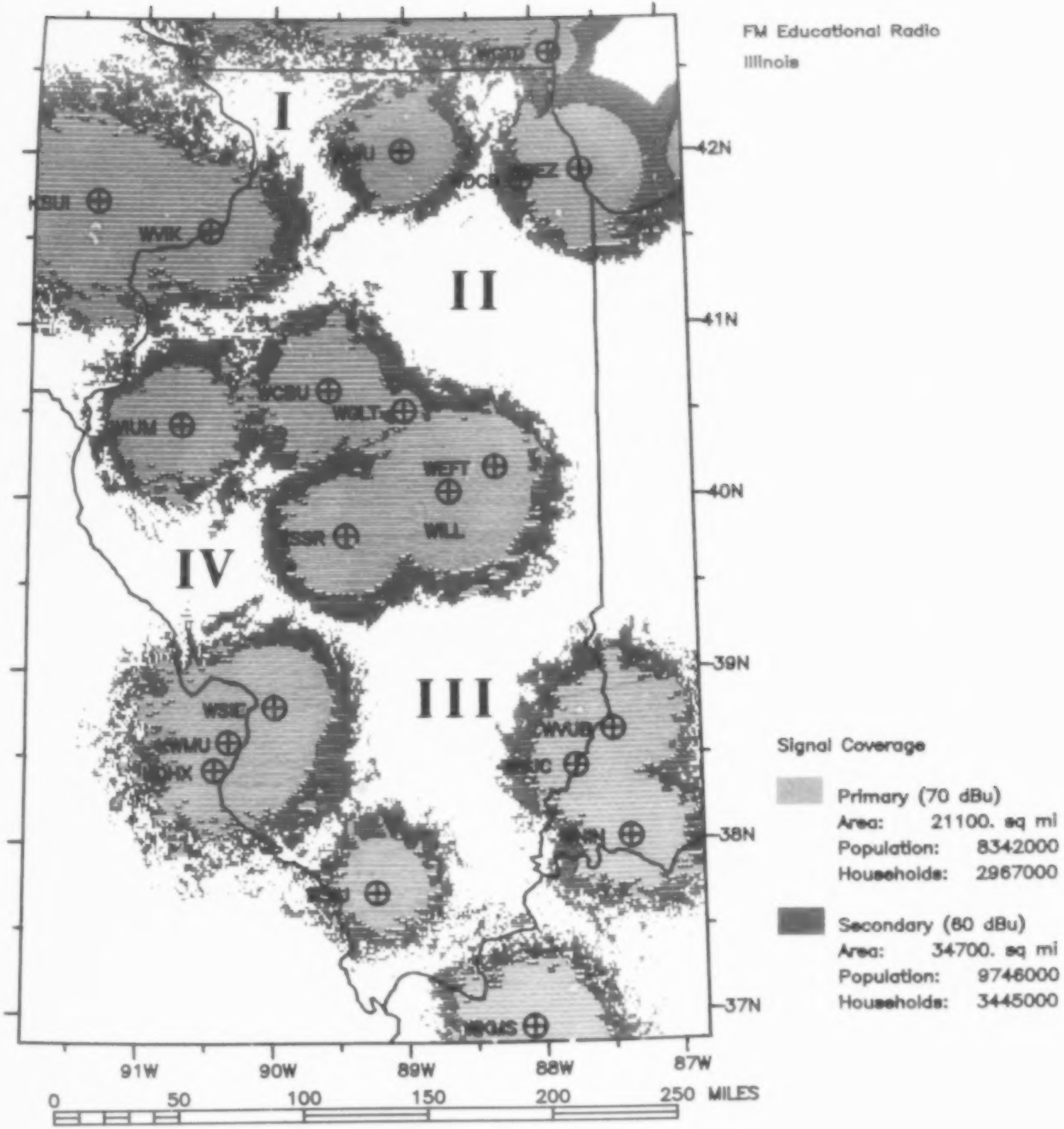
A small portion of Region II's "white space" is within the urban signal of WILL-AM. That station's antenna is directional, sending the signal east, north and south. During the day WILL-AM broadcasts at 5 kw. At night, however, its power drops to 250 watts. Moreover, it goes off the air at 9 pm. The region, then, does not receive consistent full public radio service. Because the area is so large, the most practical coverage solution would be the activation of two full-service FM stations or a combination of a new station and a satellite repeater. This assumes that there are no regulatory prohibitions.

Region III

Region III is the southern part of the state and receives some service from WVUB-FM in Vincennes, Indiana. Included in this region is a 50 kw station, WVJC-FM, located in Mt. Carmel, near the Indiana border; as a student station, WVJC did not meet the criteria for inclusion in this study. Again, the most economical solution to serve this large area would be activation of full-service stations, satellite repeaters or a combination of these.

Region IV

Region IV is unserved for indeterminate reasons. Service, however, could be provided by activation of a full-service station or the establishment of repeater stations as satellites of any of the three surrounding stations.



FM Educational Radio

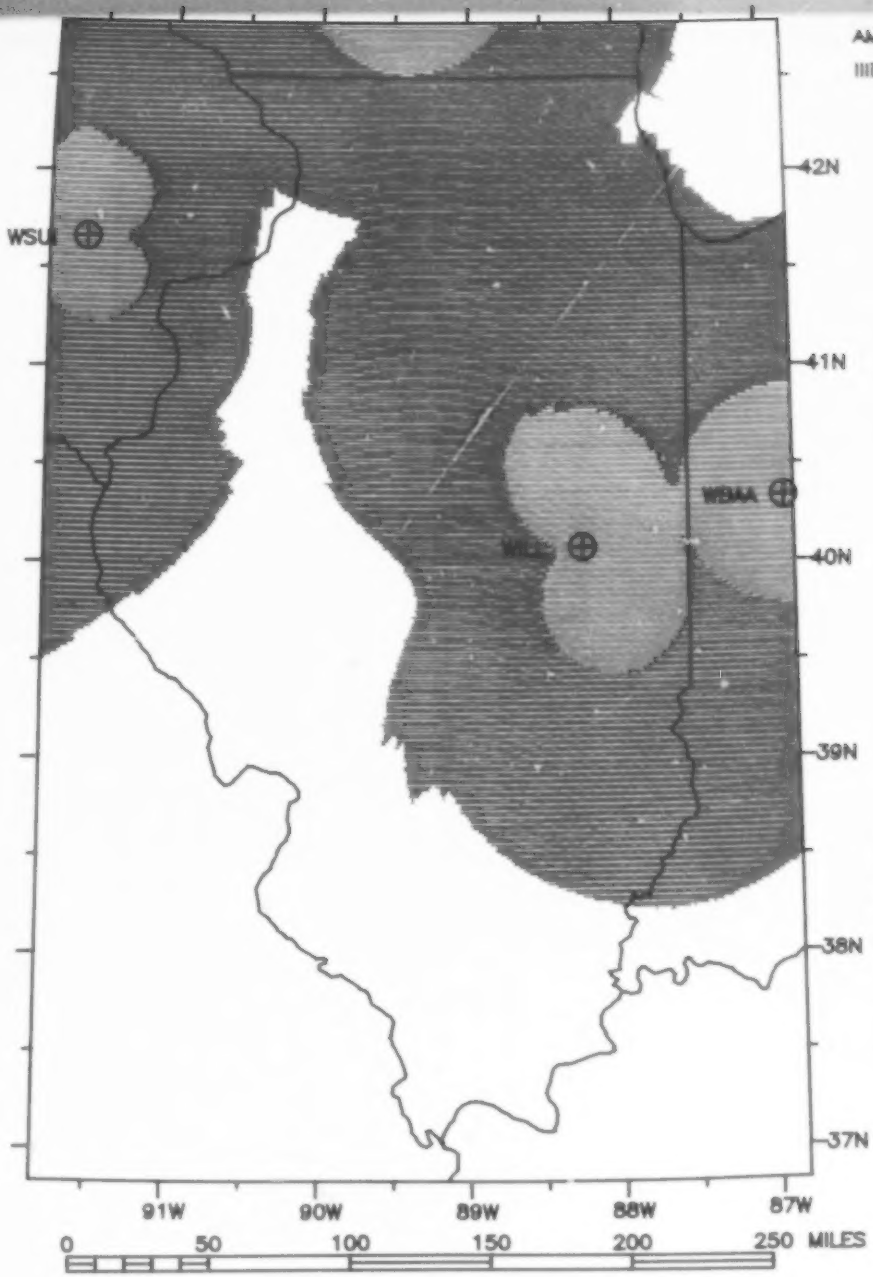
Illinois

Signal Coverage

Primary (70 dBu)
Area: 21100. sq mi
Population: 8342000
Households: 2967000
Secondary (60 dBu)
Area: 34700. sq mi
Population: 9746000
Households: 3445000
I
II
III
IV
WGTD
KSUI
WVIK
WCBU
WGLT
WIUM
WEFT
WILL
WSIE
KWMU
KDHX
WVUB
WKMS
42N
41N
40N
39N
38N
37N
91W
90W
89W
88W
87W
0
50
100
150
200
250 MILES

AM Educational Radio

Illinois


WSUI
WILL
WBAA
42N
41N
40N
39N
38N
37N
91W
90W
89W
88W
87W
0
50
100
150
200
250 MILES

Signal Coverage

▨ Urban

Area:	4600. sq mi
Population:	327000
Households:	119000

▨ Rural

Area:	38600. sq mi
Population:	9481000
Households:	3342000

INDIANA

Basic Statistics

Total State Population:	5,490,000	
Total Population Receiving Public Radio Signal:	4,151,000	(76%)
Total Population in Uncovered Areas:	1,339,000	

Public Radio Stations in State

Community	Call Letters
Bloomington	WFIU-FM
Evansville	WNIN-FM
Ft. Wayne	WBNI-FM
Indianapolis	WAJC-FM
	WFYI-FM
Muncie	WBST-FM
New Albany	WNAS-FM
Richmond	WECI-FM
Vincennes	WVUB-FM
West Lafayette	WBAA-AM

General Comments

Indiana receives public radio signals from a variety of licensee types. Stations are licensed to educational institutions, school districts and community-based nonprofit educational organizations. In addition, public radio signals from stations in the adjoining states of Illinois, Kentucky and Ohio are also received along the common state boundaries. In two cases (Louisville, KY and Oxford, OH) public stations are located essentially on the state lines and thus provide a public radio signal to large portions of Indiana.

Uncovered Areas

The coverage figures shown above reflect only the coverage of the FM public radio stations serving Indiana. Although a major portion of the Indiana map appears to be uncovered, in reality an AM public radio station (WBAA-AM, West Lafayette) covers a large portion of this area. Accordingly, public radio coverage is actually greater than the percentage indicated in the above figures.

Region 1

Region I actually consists of two areas in the western part of the state divided by the signal coverage of WBAA-AM, West Lafayette. The AM coverage is shown on a separate map. WBAA-AM appears to cover about 30-40 percent of the open space shown as Region I on the FM map. At night, however, WBAA is required to reduce its power from 5 kw to 1 kw and to use a directional antenna. During the nighttime hours, the main lobe of the directional signal is pointed northeast and the "urban" signal contour shrinks to about 15 to 20 miles.

This region contains an estimated 80 percent of the state's unserved population. Coverage by repeaters or full-service stations appears to be an appropriate means of providing signal to these two areas of Region I.

Region II

Region II is located northeast of Muncie (WBST-FM). This area could be served by a repeater/satellite station of adjacent stations.

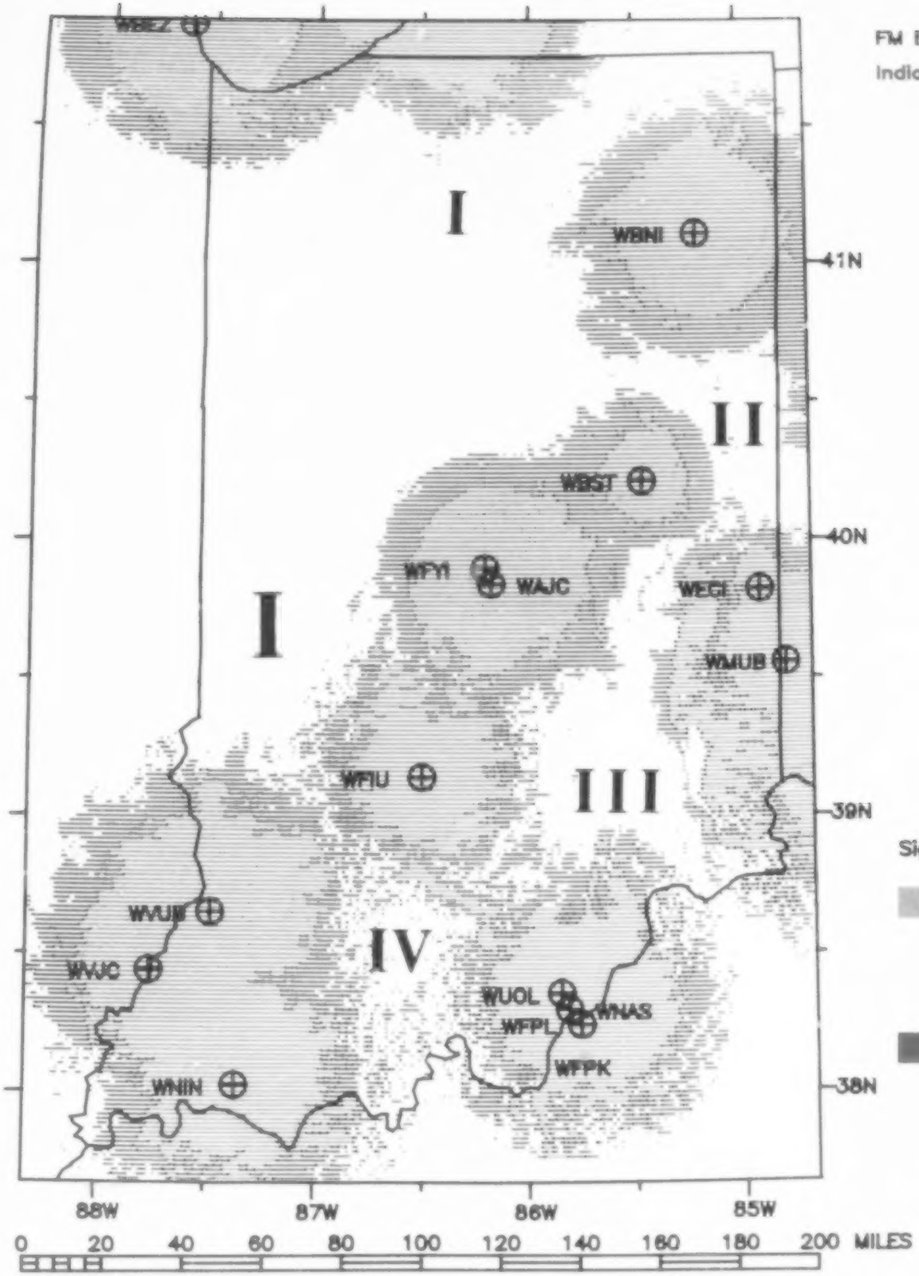
Region III

Region III is east of Bloomington (WFIU-FM) and perhaps should be considered for either a new full-service station or a satellite/repeater station of one of the adjacent stations.

Region IV

Region IV is essentially defined by the Hoosier National Forest. Because of its sparse population, any additional service to this area could be most efficiently provided by public radio translators.

FM Educational Radio
Indiana


WBEZ
I
WBNI
41N
II
WBST
40N
WFYI
WAJC
WECI
I
WMUB
WFIU
III
39N
WVUB
IV
WVJC
WUOL
WNAS
WFPL
WFPK
WNIN
38N
88W
87W
86W
85W
0
20
40
60
80
100
120
140
160
180
200 MILES

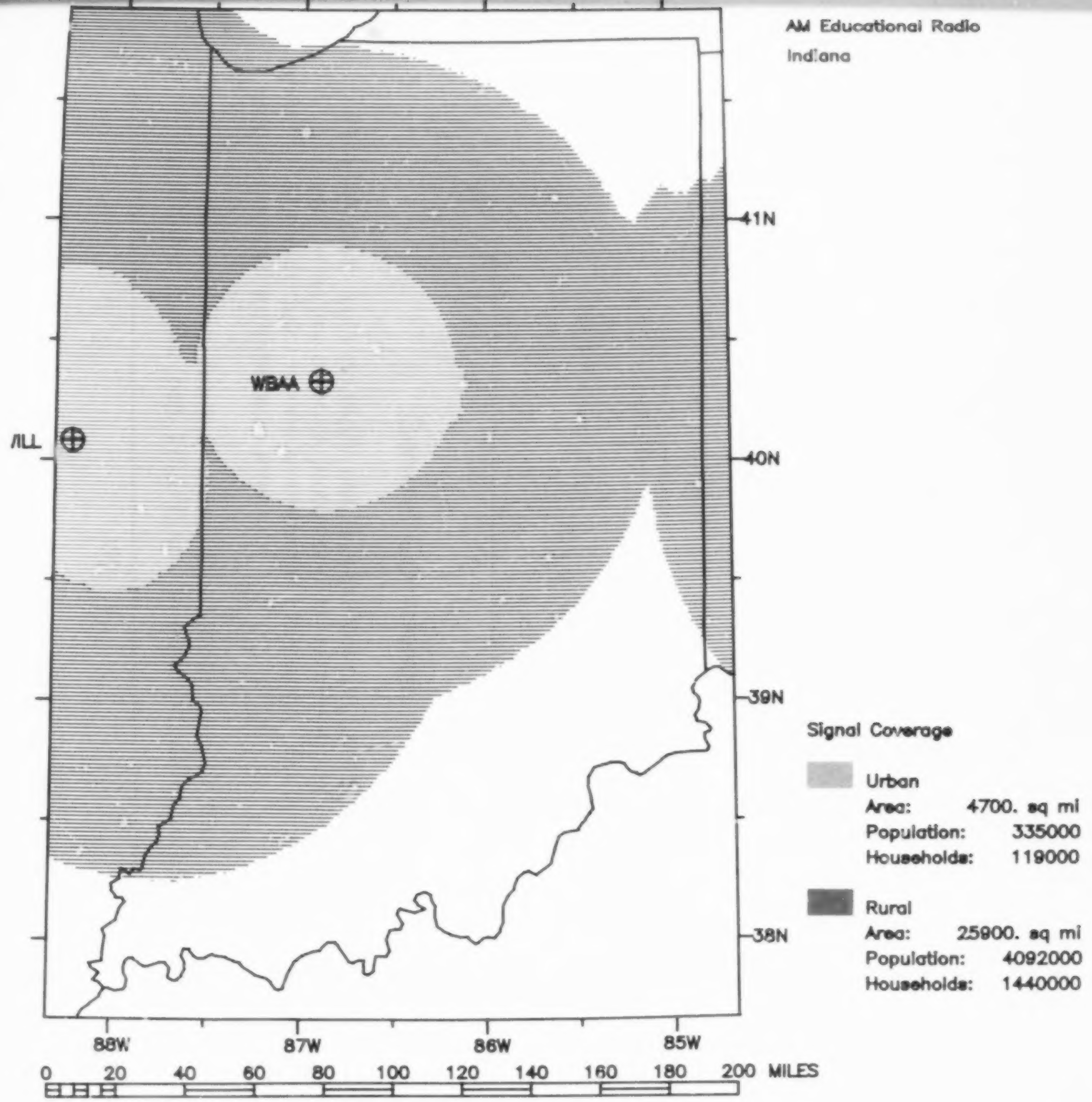
Signal Coverage

▨ Primary (70 dBu)
Area: 12700. sq mi
Population: 3206000
Households: 1131000

▨ Secondary (60 dBu)
Area: 20400. sq mi
Population: 4151000
Households: 1458000

AM Educational Radio

Indiana


41N
40N
39N
38N
WBAA
/ILL
88W
87W
86W
85W
0
20
40
60
80
100
120
140
160
180
200 MILES
Signal Coverage
Urban
Area: 4700. sq mi
Population: 335000
Households: 119000
Rural
Area: 25900. sq mi
Population: 4092000
Households: 1440000

IOWA

Basic Statistics

Total State Population:	2,914,000
Total Population Receiving Public Radio Signal:	2,486,000 (85%)
Total Population in Uncovered Areas:	428,000

Public Radio Stations in State

Community	Call Letters
Ames	WOI-AM
	WOI-FM
Cedar Falls	KHKE-FM
	KUNI-FM
Cedar Rapids	KCCK-FM
	KOJC-FM
Council Bluffs	KIWR-FM
Decorah	KLCD-FM
Des Moines	KUCB-FM
Fort Dodge	KTPR-FM
Iowa City	KSUI-FM
	KSUI-AM
Mason City	KUNY-FM
Sioux City	KWIT-FM
Waterloo	KBBG-FM

General Comments

Iowa has relatively flat topography that presents few broadcast propagation problems. The only area having any coverage problems is the eastern border where the Mississippi River Valley causes major terrain problems for FM signals. The majority of the state's population receives a public radio service.

Most of Iowa's cities are relatively small. Des Moines, (pop. 91,003), Waterloo (pop. 75,985) and Cedar Rapids (pop. 110,243) are the major population centers.

Uncovered Areas

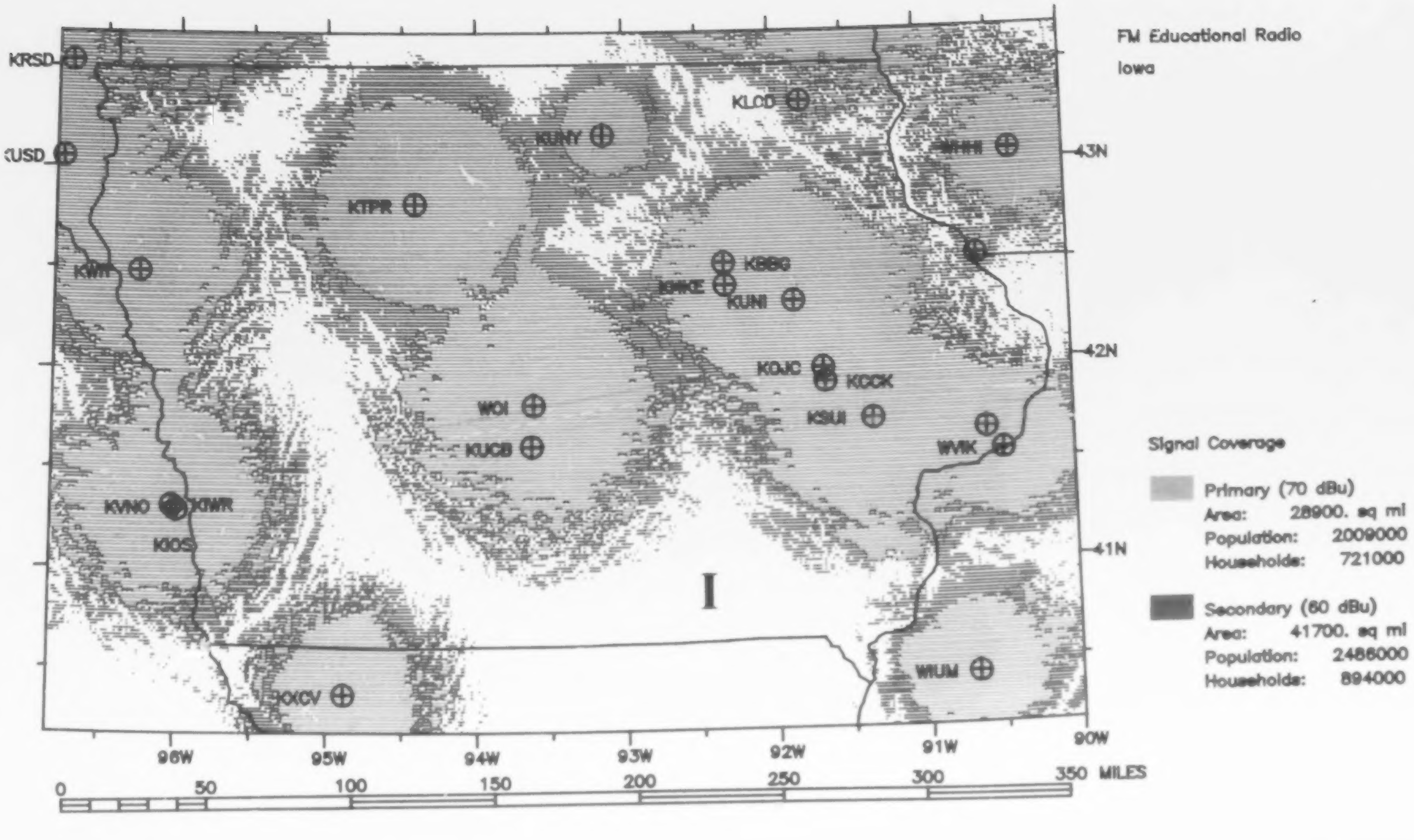
Region I

The southern border of the state has limited coverage from public radio. Burlington and Ottumwa are the largest towns in this area. Neither city has more than 30,000 persons. It may be possible to provide these communities with service through the use of translators from Iowa City (KSUI) or Ames (WOI-FM).

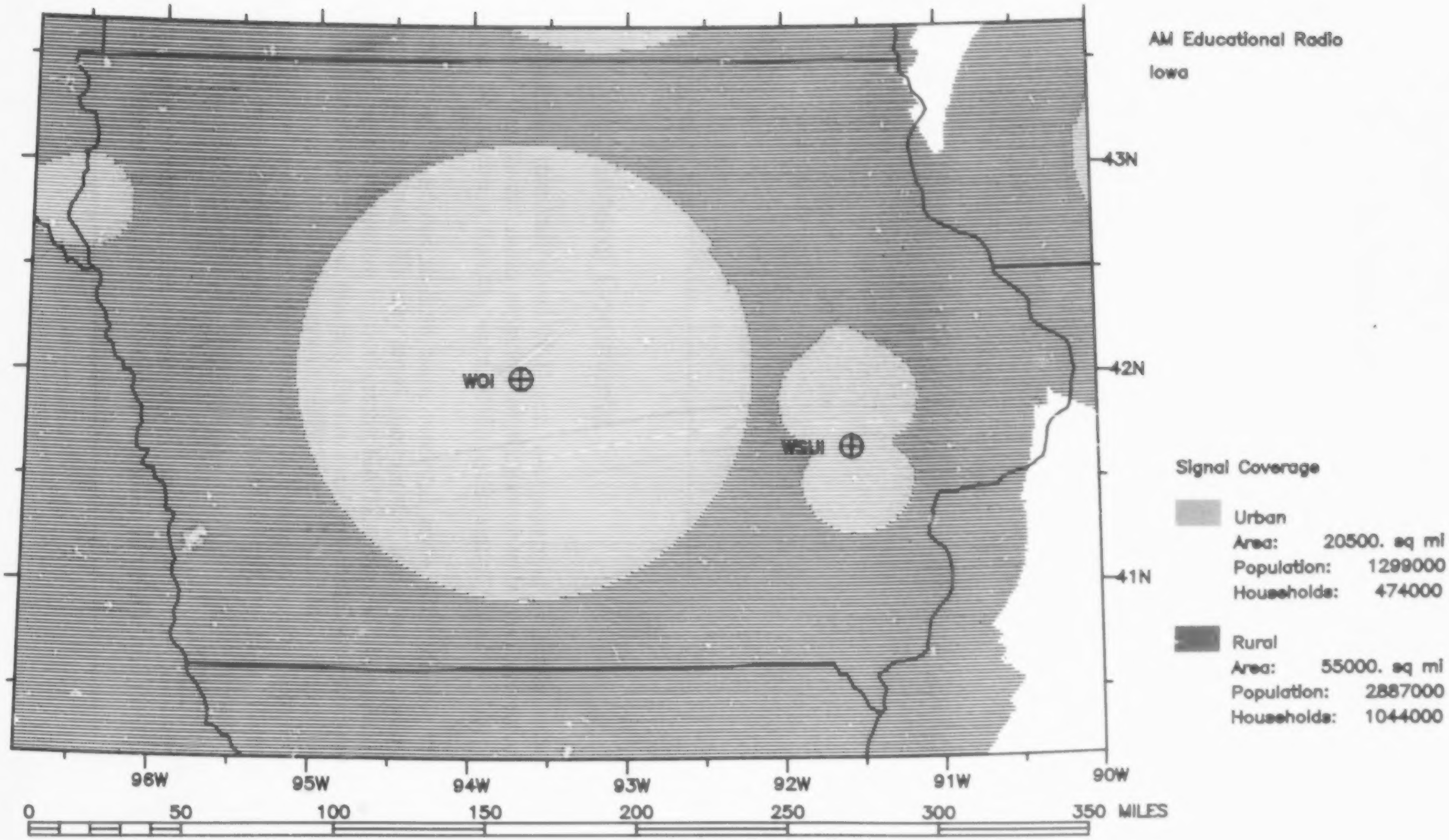
About 400,000 people in this region do not receive an FM public radio signal. Of course, a substantial portion of the western part of the region is within the Urban contour of WOI-AM of Ames. At night, however, WOI-AM reduces its power by 80 percent and uses a directional antenna with the signal pointed east.

FM Educational Radio

Iowa



KRSD
KUSD
KWIT
KVNO
KIWR
KIOS
KXCV
KTPR
KUNY
WOI
KUCB
KLCD
KBBG
KWKE
KUNI
KOJC
KCCK
KSUI
WHHI
WVIK
WIUM
I
43N
42N
41N
96W
95W
94W
93W
92W
91W
90W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Primary (70 dBu)
Area: 28900. sq mi
Population: 2009000
Households: 721000
Secondary (60 dBu)
Area: 41700. sq mi
Population: 2486000
Households: 894000


AM Educational Radio
Iowa

WOI
WSUI
43N
42N
41N
96W
95W
94W
93W
92W
91W
90W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Urban
Area: 20500. sq mi
Population: 1299000
Households: 474000
Rural
Area: 55000. sq mi
Population: 2887000
Households: 1044000

KANSAS

Basic Statistics

Total State Population:	2,364,000
Total Population Receiving Public Radio Signal:	1,950,000 (82%)
Total Population in Uncovered Areas:	414,000

Public Radio Stations in State

Community	Call Letters
Garden City	KANZ-FM
Hill City	KZNA-FM
Hutchinson	KHCC-FM
Lawrence	KANU-FM
Pittsburg	KRPS-FM
Salina	KHCD-FM
Wichita	KMUW-FM

General Comments

The accompanying map shows that vast areas of Kansas are unserved by public radio. Nonetheless, a review of the public radio situation in Kansas reveals that almost all communities of any size do receive a Kansas-based public radio signal.

West Kansas, for example, would appear to have many unserved areas. But virtually this entire region is composed of farmland with very small communities sprinkled throughout. An ambitious program of signal expansion carried on by KANZ-FM, which broadcasts from the Garden City/Pierceville area, has reached almost every community of any size. KANZ has constructed a major satellite repeater in Hill City (KZNA-FM). It has also installed -- or will very shortly install -- FM translators in St. Francis, Goodland, Sharon Springs, Tribune, Elkhart, McDonald, Atwood, Herndon, Colby, Ness City, Hays, Dodge City, Liberal and Ashland.

Station KANZ is not alone in carrying out expansion projects. Within the past year, KHCC-FM, Hutchinson, activated a full-power satellite repeater in Salina and KANU-

FM, Lawrence, has or soon will activate translators in Manhattan, Junction City, Emporia, Pittsburg, Parsons and Independence.

These recent extension projects were complemented in 1988 by the establishment of KRPS-FM, a full-power, full-service station that broadcasts from Pittsburg, in the extreme southeast of the state.

Virtually all public radio stations in Kansas are autonomous, the exceptions being the major repeater stations in Hill City and Salina.

Uncovered Areas

One thing may be said of all of the three unserved regions that we have identified: they are rural areas with low -- in some cases, extremely low -- population density levels. Economics will therefore play a big role in any station's calculations concerning the feasibility of signal extension. One public radio official in the region said that many of the communities were so small that they would probably never get a signal, even from translators.

Region I

Region I runs from north to south through Russell, Great Bend and Pratt. In spite of its being sparsely populated, this region appears to hold the most promise for signal extension. The presence of the three communities just cited would suggest the possibility of one or two major satellite repeaters or a series of FM translators. Approximately 44 percent of the state's unserved population resides in this area.

Region II

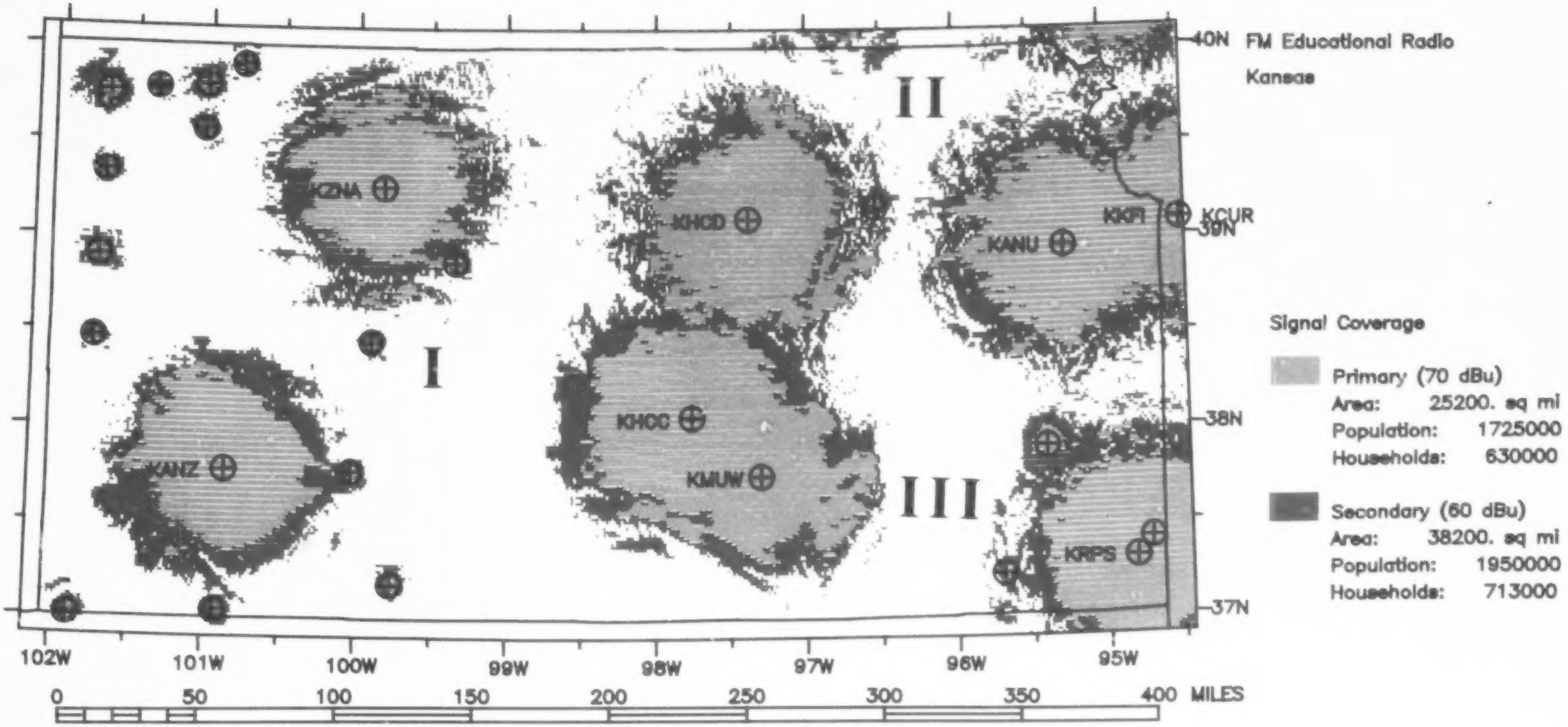
The center of Region II is north/northeast of Manhattan. Very sparsely populated, this area could probably support only translators. This area contains an estimated 20 percent of the unserved population.

Region III

Region II is the southeast part of Kansas, the greater part of which is composed of the Flint Hills. About 35 percent of the state's unserved population lives in this area. Exactly the same may be said of Region III as was said of Region II. For example, the combined population of Elk and Chautauqua Counties, in the extreme south of this unserved region, is only about 9,000. If it is ever served at all, it will almost assuredly be via translators.

FM Educational Radio

Kansas


II
KZNA
KHOD
KKFI
KCUR
KANU
I
KHCC
KMUW
KANZ
III
KRPS
40N
39N
38N
37N
102W
101W
100W
99W
98W
97W
96W
95W
0
50
100
150
200
250
300
350
400 MILES

Signal Coverage

Primary (70 dBu)
Area: 25200. sq mi
Population: 1725000
Households: 630000

Secondary (60 dBu)
Area: 38200. sq mi
Population: 1950000
Households: 713000

KENTUCKY

Basic Statistics

Total State Population:	3,661,000
Total Population Receiving Public Radio Signal:	3,004,000 (82%)
Total Population in Uncovered Areas:	657,000

Public Radio Stations in State

Community	Call Letters
Bowling Green	WKYU-FM
Hazard	WEKH-FM
Highland Hgts.	WNKU-FM
Lexington	WBKY-FM
Louisville	WFPK-FM WFPL-FM WUOL-FM
Morehead	WMKY-FM
Murray	WKMS-FM
Richmond	WEKU-FM
Somerset	WDCL-FM
Whitesburg	WMMT-FM

General Comments

The residents of Kentucky receive public radio signals from stations licensed to educational institutions and nonprofit community-based organizations. Kentucky has no state public radio network. In addition, signals from adjoining states are also received in large areas of Kentucky.

Uncovered Areas

Of the four noteworthy regions that appear to be uncovered by a public radio signal, Regions III and IV contain the majority of the unserved population (24 percent and 57 percent respectively) .

Region I

Region I is the extreme western part of the state. The Murray station, WMKY-FM, is the logical choice to provide coverage to this area. A discussion with the station manager for WMKY-FM reveals that although the area is outside the station's signal contour, the WMKY-FM signal is readily available in this region. Should expanded coverage be determined to be necessary, the addition of one or more FM translators appears to be an economically viable means of providing a stronger signal to the area.

Region II

Region II is the area northwest of Bowling Green and northeast of Murray. The station manager of the Bowling Green station reports that WKYU-FM has been awarded an FCC construction permit for a new repeater/satellite station in Henderson, KY. When this station is placed into service, public radio coverage should be significantly increased in this area.

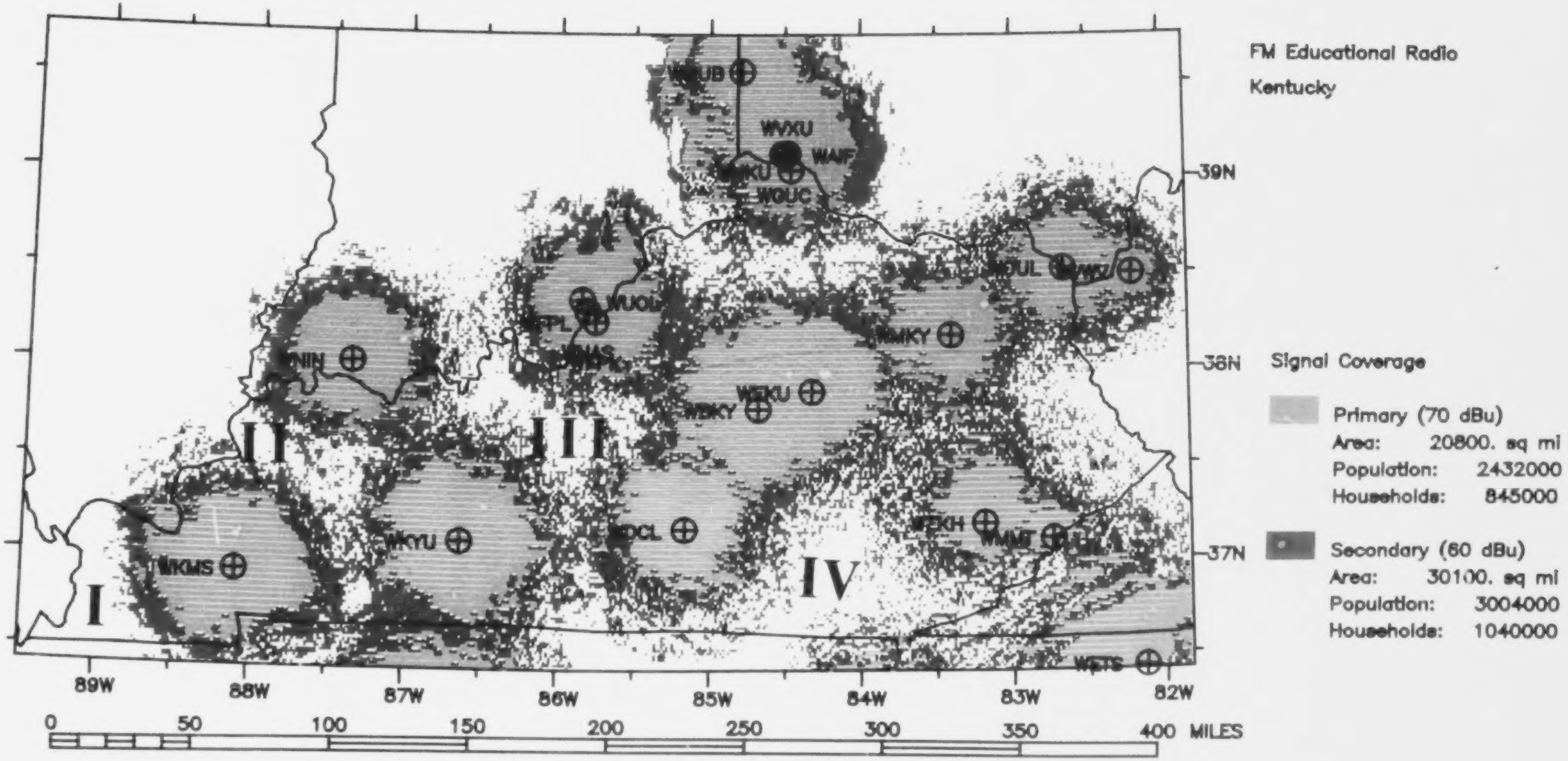
Region III

Region III is the area between Bowling Green and Louisville. This area could receive an improved signal by constructing a satellite station to repeat the signal of either the Bowling Green or the Louisville stations.

Region IV

This is the southeastern corner of the state. Much of this region lies within the Daniel Boone National Forest. As such, it is natural to assume that any additional service to this area will be in the form of either radio translators and/or a satellite repeater station. Due to terrain considerations, translators may be the most economically viable alternative.

best copy available



FM Educational Radio

Kentucky

Signal Coverage
▨ Primary (70 dBu)
Area: 20800. sq mi
Population: 2432000
Households: 845000
■ Secondary (60 dBu)
Area: 30100. sq mi
Population: 3004000
Households: 1040000
WVXU
WAIF
WGUC
WMKY
WEKU
WBKY
WFPL
WNIN
WKMS
WKYU
WDCL
WEKH
WMMT
I
II
III
IV
39N
38N
37N
89W
88W
87W
86W
85W
84W
83W
82W
0
50
100
150
200
250
300
350
400 MILES

LOUISIANA

Basic Statistics

Total State Population:	4,206,000
Total Population Receiving Public Radio Signal:	3,546,000 (84%)
Total Population in Uncovered Areas:	660,000

Public Radio Stations in State

Community	Call Letters
Alexandria	KLSA-FM
Baton Rouge	WRKF-FM
Hammond	KSLU-FM
Lafayette	KRVS-FM
Monroe	KNLU-FM
New Orleans	WRBH-FM (Radio Reading Service) WWNO-FM WWOZ-FM
Shreveport	KDAQ-FM

General Comments

Public radio is provided to the residents of Louisiana by a variety of university-licensed and community-based nonprofit educational organizations. There is no state-supported public radio network *per se* although state funds do support the stations licensed to universities.

Uncovered Areas

There are basically three regions in Louisiana that do not receive a public radio signal.

Region I

Region I is defined by the circular area around Monroe and especially the area to the east of Monroe. This region is estimated to include 45 percent of the state's unserved population. At present, Northeast Louisiana University is proposing the construction of a full-service public radio station to serve this area. PTFP has provided funding for the planning of this station. Any remaining pockets not receiving a signal could be considered for signal coverage via radio translators.

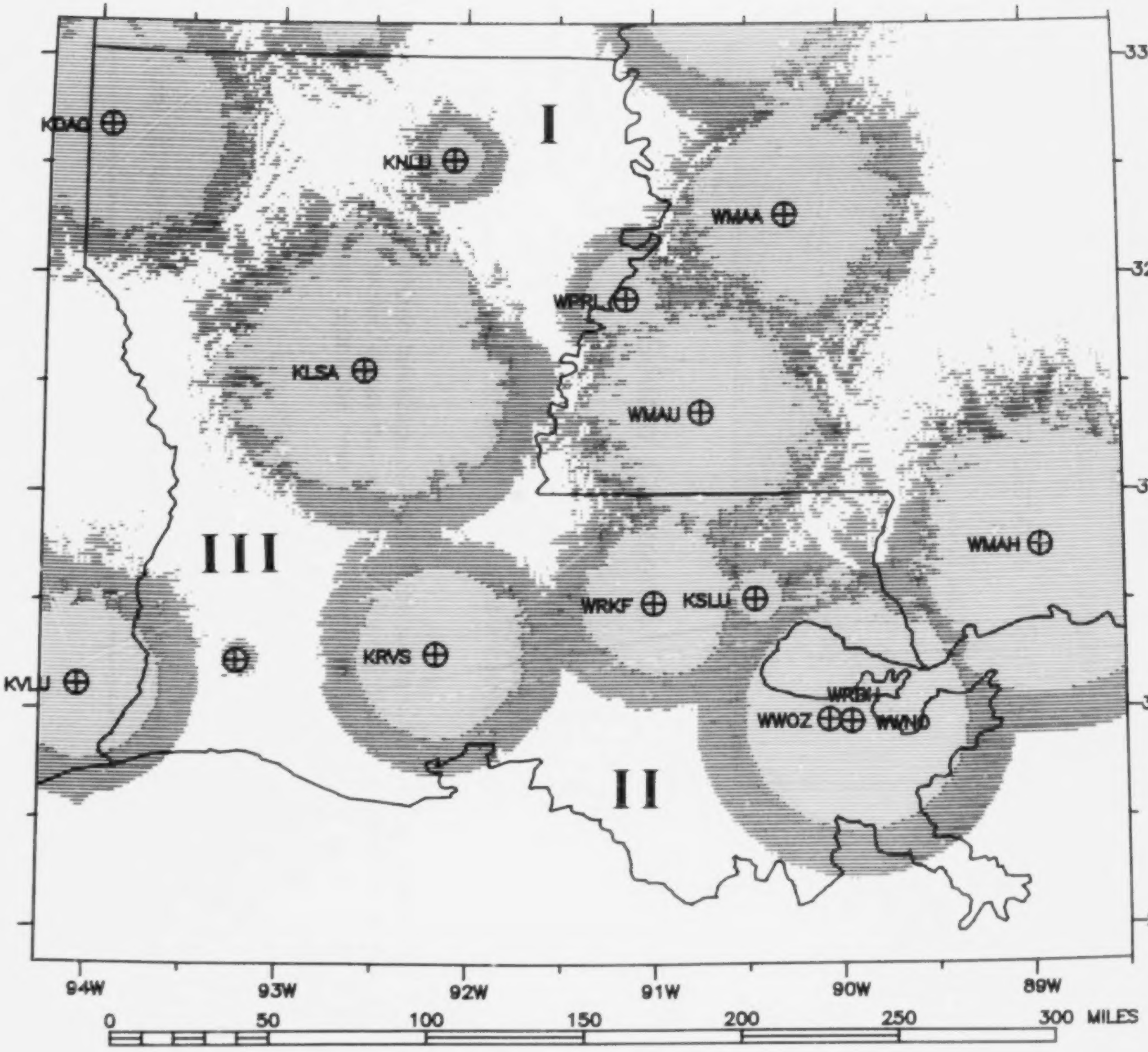
Region II

Region II is the area to the southwest of New Orleans that does not receive a public radio signal. Any uncovered pockets of population could be considered for coverage by radio translators. Because of the Acadian population living in this area, KRVS-FM (a Lafayette public radio station that broadcasts a significant amount of Acadian language programming) should also be considered as a possible signal provider for this area. Approximately 28 percent of the uncovered population resides here.

Region III

This area approximates the circular region surrounding the Lake Charles radio translator, which repeats the Lafayette station, KRVS-FM. One possibility for additional coverage would be to convert the translator to a repeater/satellite station. This would provide a considerable increase in coverage. Since this region is within a channel 6 interference contour (Beaumont, TX), any proposal would have to comply with the relevant restrictions. About 23 percent of the state's unserved population is included in this area.

FM Educational Radio
Louisiana


33N
32N
31N
30N
29N
94W
93W
92W
91W
90W
89W
0
50
100
150
200
250
300 MILES
I
II
III
KDAQ
KNLU
WMAA
WPRL
KLSA
WMAU
WMAH
WRKF
KSLU
KRVS
KVLU
WRBH
WWOZ
WWNO

Signal Coverage

▨ Primary (70 dBu)

Area:	18700. sq mi
Population:	2926000
Households:	994000

▨ Secondary (60 dBu)

Area:	33100. sq mi
Population:	3546000
Households:	1197000

MAINE

Basic Statistics

Total State Population:	1,125,000
Total Population Receiving Public Radio Signal:	933,000 (83%)
Total Population in Uncovered Areas:	192,000

Public Radio Stations in State

Community	Call Letters
Bangor	WMEH-FM
Calais	WMED-FM
Portland	WMEA-FM
Presque Isle	WMEM-FM
South Blue Hill	WERU-FM
Waterville	WMEW-FM

General Comments

The majority of the population in Maine receives public radio, primarily from the University of Maine System (UMS) network. Of the six stations serving the state, five are licensed to the UMS which programs the system of repeater transmitters from the flagship facility in Bangor. WERU of South Blue Hill is a community station funded by PTFP in 1988.

Mountains dominate the Maine landscape, especially the western half of the state. The public radio coverage, however, tracks the population density along the eastern coast of the Atlantic extending north along the eastern Canadian boundary.

Uncovered Areas

Region I

The majority of "white space" occurs in Region I, which is unpopulated and mountainous.

Region II

Region II is the northeasternmost tip of the state bordering Canada. The area is called the St. John River Valley. This valley community is surrounded by rugged terrain and receives unreliable signals. While there are no immediate implementation plans because of the small population, it is the assessment of the state that translators could be an effective means of providing service. Frequencies for a full-powered station are unavailable because of a Canadian channel 6 problem.

Region III

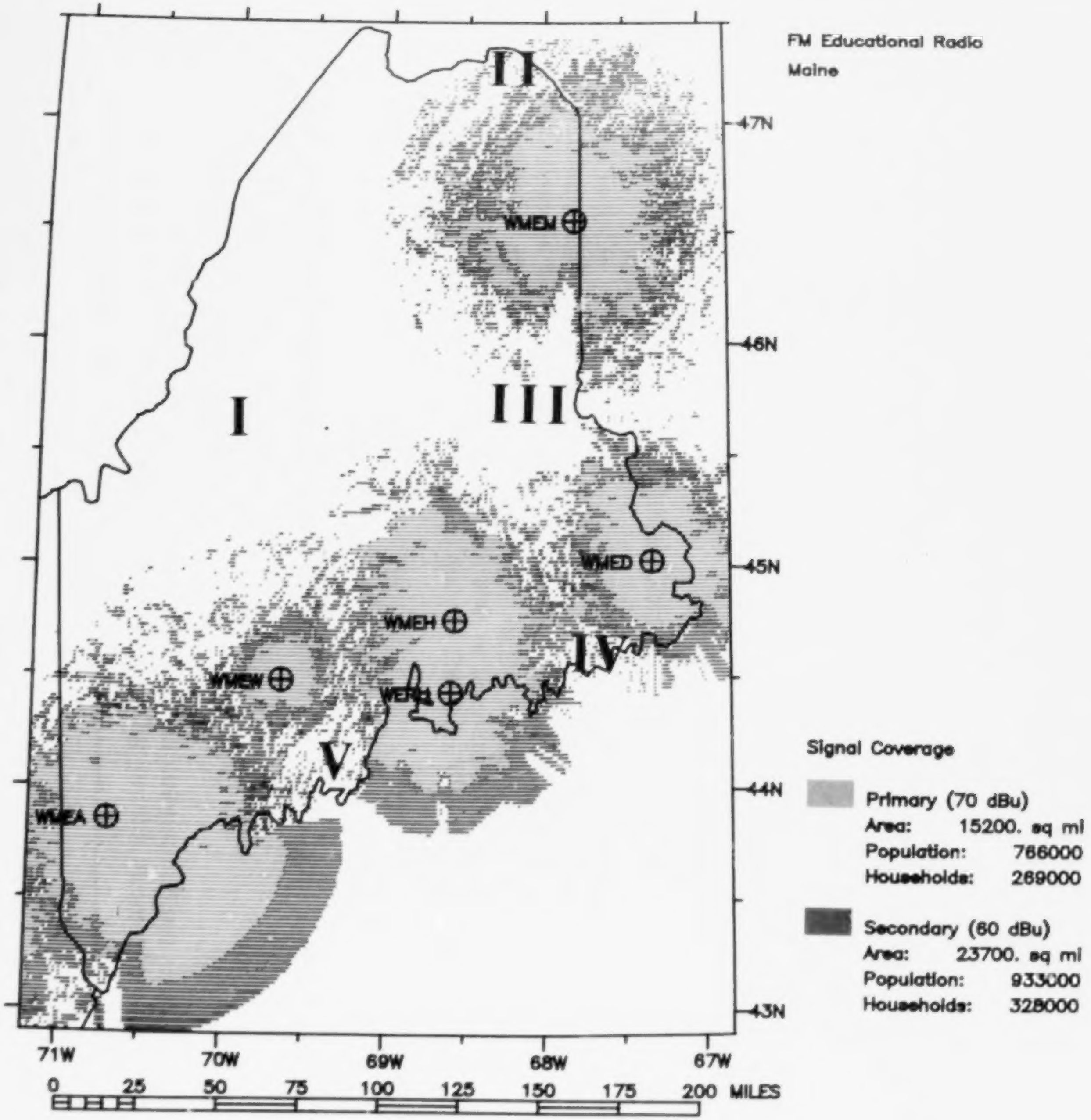
Region III lies between the signals of WMEM and WMED. While translators could be used to provide a signal here, the area is sparsely populated and therefore, the economic and practical viability of providing coverage is questionable.

Regions IV and V

Regions IV and V, along the coast, are pockets of poor to non-existent coverage. The UMS is currently engaged in a frequency search for both areas. Preliminary results indicate a scarcity of spectrum space due to the proximity to Canada. If frequencies are located, the UMS is committed to constructing repeater transmitters there within a year.

Because of the ragged nature of the coverage patterns, it is difficult to estimate the percentage of the population that resides in any given unserved region. It appears, however, that Regions II, IV, and V, combined, contain approximately 120,000 people.

FM Educational Radio
Maine


II
WMEM
III
I
WMED
WMEH
IV
WMEW
WERU
V
WMEA
47N
46N
45N
44N
43N
71W
70W
69W
68W
67W
0
25
50
75
100
125
150
175
200 MILES
Signal Coverage
Primary (70 dBu)
Area: 15200. sq mi
Population: 766000
Households: 269000
Secondary (60 dBu)
Area: 23700. sq mi
Population: 933000
Households: 328000

MARYLAND

Basic Statistics

Total State Population:	4,217,000
Total Population Receiving Public Radio Signal:	3,954,000 (94%)
Total Population in Uncovered Areas:	263,000

Public Radio Stations in State

Community	Call Letters
Baltimore	WBJC-FM WEAA-FM WJHU-FM
Princess Anne	WESM-FM
Salisbury	WSCL-FM

General Comments

Public radio is provided to residents of Maryland by several stations licensed to educational institutions and one community-based nonprofit educational organization which operates WSCL-FM in Salisbury. WSCL-FM, while licensed to Salisbury, operates from a tower site in Seaford, Delaware. By using the Seaford tower, the station is able to cover parts of Delaware that would otherwise be uncovered. In addition to Maryland stations, several stations from other states and the District of Columbia provide coverage to the state.

Uncovered Areas

There are two basic regions of Maryland that appear to be uncovered by a public radio signal.

Region I

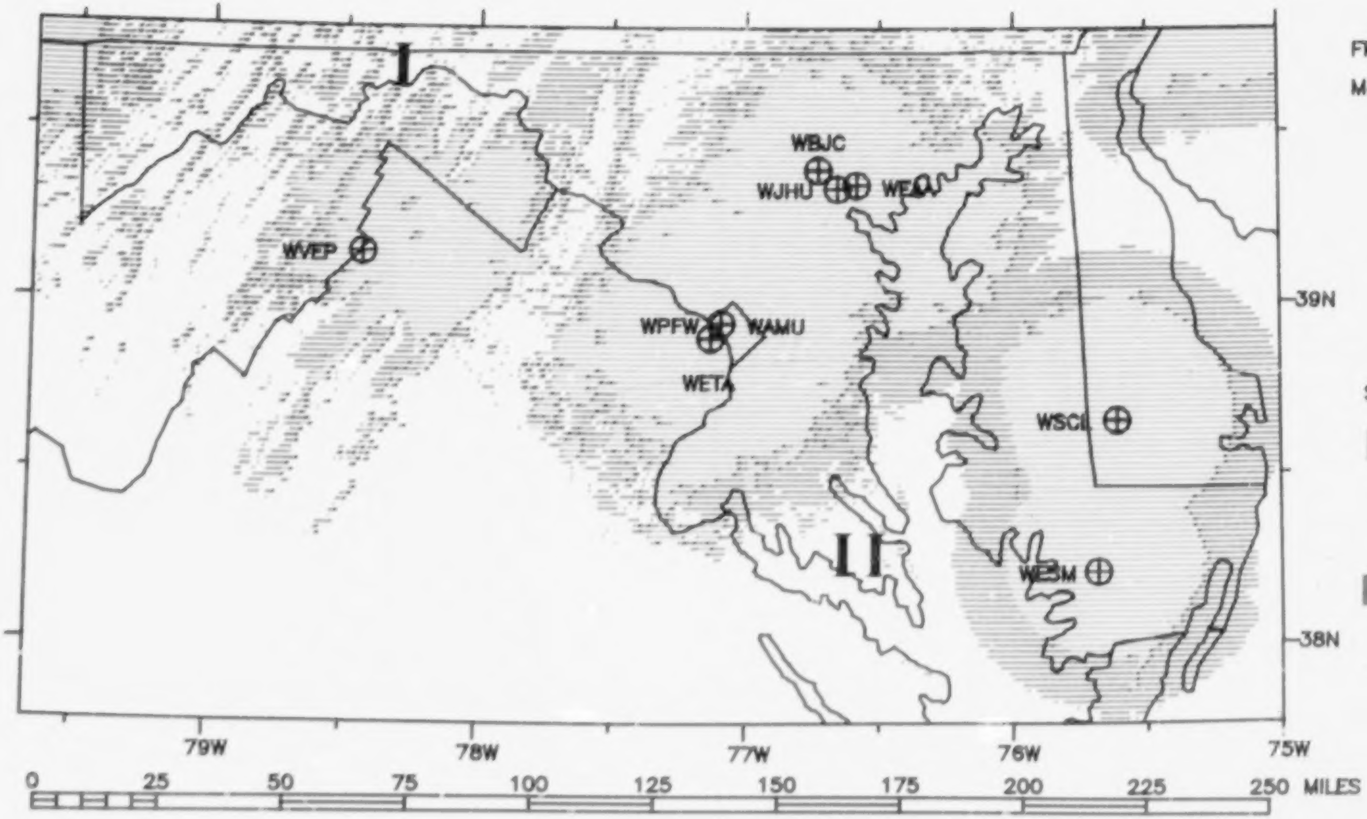
This region is the western part of the state. It contains an estimated 15,000 people. It is without a reliable signal due to terrain considerations. One possible means of providing a signal to this area would be to construct repeater/satellite stations in Hagerstown and/or Cumberland. It may be technically possible to construct a repeater/satellite station in Hagerstown to repeat one of the Baltimore public radio signals. The Hagerstown signal could then be repeated in Cumberland. This scenario is possible only if FCC requirements could be met.

Region II

Region II is the southern tip of the western shore of Maryland. This area lies west of the Princess Anne station, WESM-FM, and is west of the Chesapeake Bay. The stations in the Washington, D.C. metropolitan area are perhaps the most realistic sources of a signal for this area. A series of translators or a small repeater/satellite station appears to be an economically viable means of providing a signal to the approximately 90,000 unserved residents of this area.

FM Educational Radio

Maryland


WBJC
WJHU
WEAA
WVEP
WPFW
WAMU
WETA
WSCL
WESM
39N
38N
79W
78W
77W
76W
75W
0
25
50
75
100
125
150
175
200
225
250 MILES

Signal Coverage

▨ Primary (70 dBu)
Area: 5900. sq mi
Population: 3600000
Households: 1252000

▨ Secondary (60 dBu)
Area: 9400. sq mi
Population: 3954000
Households: 1372000

MASSACHUSETTS

Basic Statistics

Total State Population:	5,737,000
Total Population Receiving Public Radio Signal:	5,389,000 (94%)
Total Population in Uncovered Areas:	348,000

Public Radio Stations in State

Community	Call Letters
Amherst	WFCR-FM WMUA-FM
Boston	WGBH-FM WBUR-FM WUMB-FM
Provincetown	WOMR-FM
Springfield	WTCC-FM
Worcester	WCUW-FM WICN-FM

General Comments

Massachusetts has no state agency responsible for the development of public broadcasting. Public radio is provided by a mixture of educational institutions and community entities. The majority of the state is covered.

Uncovered Areas

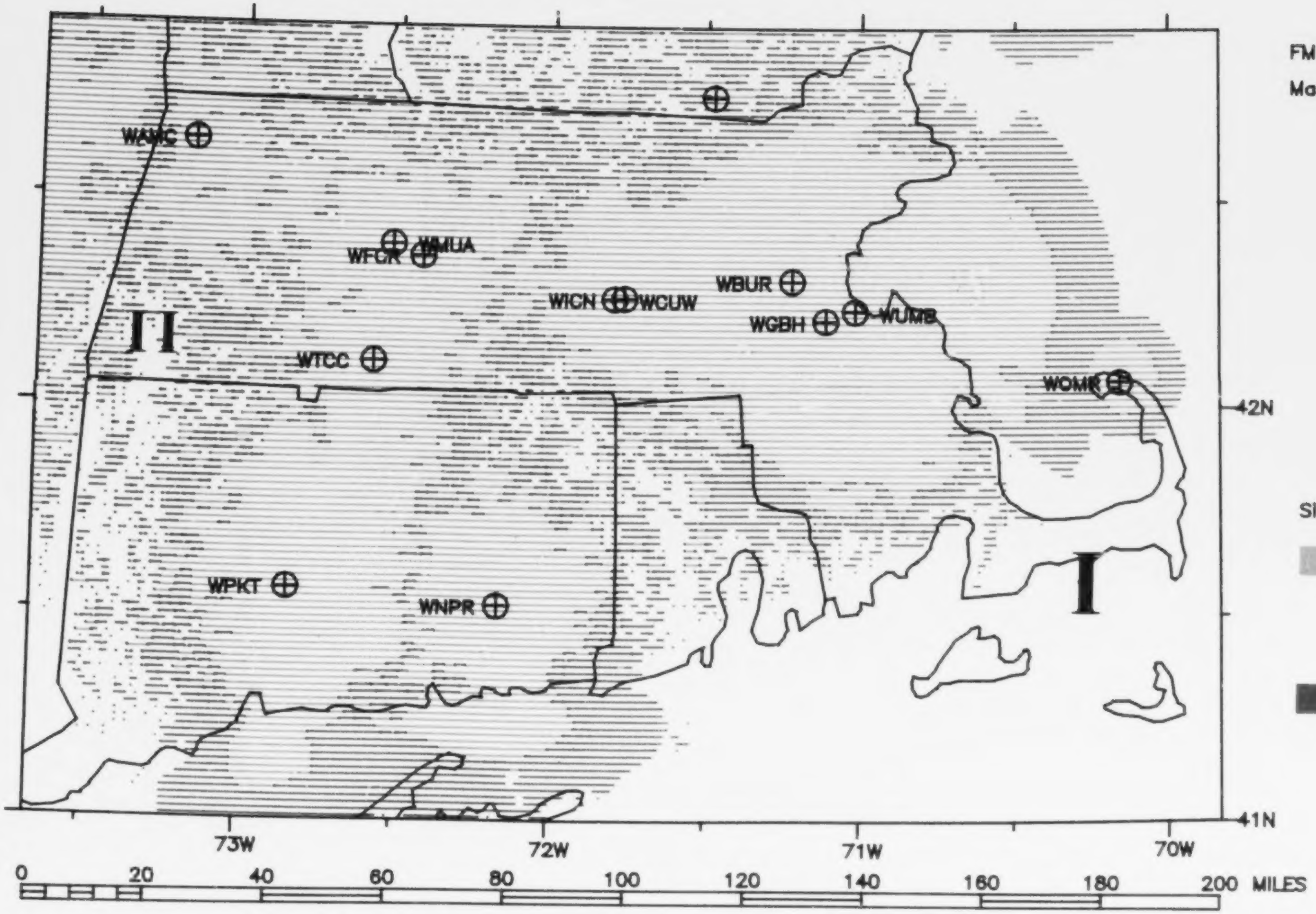
Region I

Region I includes most of Cape Cod and the two islands, Martha's Vineyard and Nantucket. These areas are "white" because they are a great distance from the nearest radio signals which are located in Boston and in Provincetown (at the very end of Cape Cod).

Boston stations provide the strongest signals to the Cape. Of those stations, the strongest signal comes from WGBH which plans no expansion into the Cape because, although its 60 dBu signal may not be received by all Cape residents, WGBH's fund raising indicates that a significant number of Cape residents receive a signal acceptable to them. Translators may be an efficient means of providing a more reliable signal to the approximately 150,000 unserved residents of the Cape.

Region II

Region II is a hilly area of the state and therefore radio signals are spotty. Population density is also low here. If technically possible, translators could bring in a signal from New York or Amherst.


WAMC
WFCR
WMUA
WICN
WCUW
WBUR
WGBH
WUMB
WTCC
WOMR
WPKT
WNPR
II
I
42N
41N
73W
72W
71W
70W
0
20
40
60
80
100
120
140
160
180
200 MILES

FM Educational Radio
Massachusetts

Signal Coverage

▨ Primary (70 dBu)
Area: 6500. sq mi
Population: 4922000
Households: 1735000

■ Secondary (60 dBu)
Area: 8600. sq mi
Population: 5389000
Households: 1899000

MICHIGAN

Basic Statistics

Total State Population:	9,262,000
Total Population Receiving Public Radio Signal:	8,700,000 (94%)
Total Population in Uncovered Areas:	562,000

Public Radio Stations in State

Community	Call Letters
Allendale	WGVU-FM
Alpena	WCML-FM
Ann Arbor	WUOM-FM
Berrien Springs	WAUS-FM
Detroit	WDET-FM
East Lansing	WKAR-FM WKAR-AM
Flint	WFBE-FM WFUM-FM
Grand Rapids	WVGR-FM
Hesperia	WBLV-FM
Houghton	WGGL-FM
Interlochen	WIAA-FM
Kalamazoo	WMUK-FM
Marquette	WNMU-FM
Mount Pleasant	WCMU-FM
Ypsilanti	WEMU-FM

General Comments

Michigan residents receive public radio signals from stations that are licensed to educational institutions, a Board of Education (WFBE-FM in Flint) and a nonprofit educational organization, the Blue Lake Fine Arts Camp, which is the licensee of WBLV-FM. In addition to the FM public radio stations, public radio is also provided by WKAR-

AM in East Lansing and several public radio translator stations which repeat the signal of their primary stations. WKAR-AM, however, is a daytime-only station which uses a directional antenna pointing its signal towards the north-northwest.

Uncovered Areas

Although the majority of the state receives a public radio signal, at least three areas still appear to be without a signal.

Region I

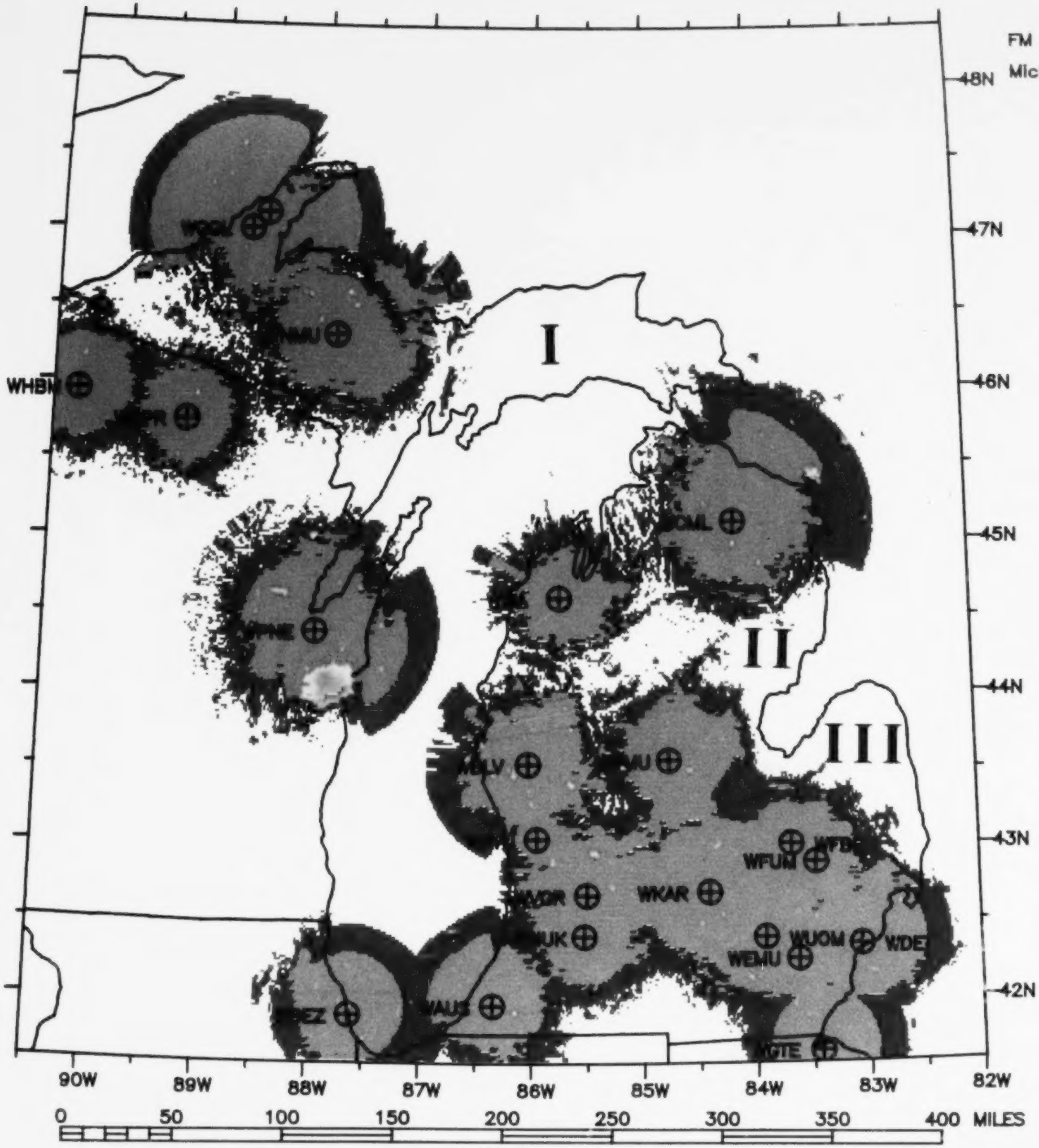
This region is located on Michigan's Upper Peninsula to the southeast and east of the Marquette public radio station (WNMU-FM). WNMU-FM station officials indicate an interest in providing service to some of the more populated communities in this area by a series of translators. Parts of this region are composed of national forests and in some parts of the region the population density is extremely sparse.

Region II

Region II is south of the Alpena station (WCML-FM) and is approximately defined by the Huron National Forest. Additional service could be provided by a series of translators or an appropriately placed satellite repeater station if the unserved population warrants it. Some of this area also receives a signal from the AM public radio station (WKAR-AM) in East Lansing.

Region III

Region III is the area northeast of Flint. A portion of this area is actually covered by the edge of the Rural-grade contour of WKAR-AM (East Lansing). A satellite repeater or a network of translators could extend public radio coverage to this region. An estimated 79 percent of the state's unserved population resides in this area.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87W
86W
85W
84W
83W
82W
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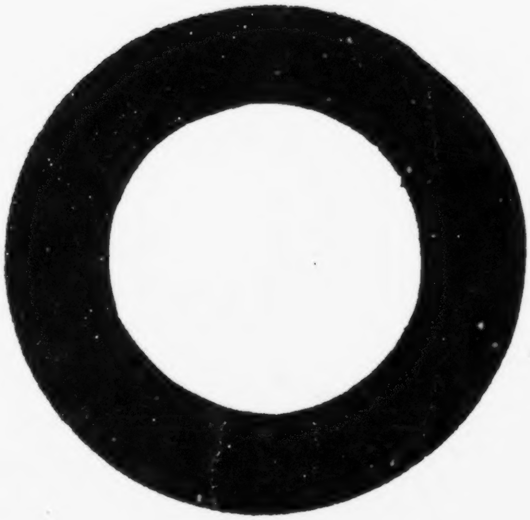
350
400
MILES
I
II
III
WHBM
NMU
WPNE
WCML
WBLV
WKAR
WFUM
WGVR
WMUK
WUOM
WEMU
WDET
WGTE
WAUS
WBEZ

FM Educational Radio

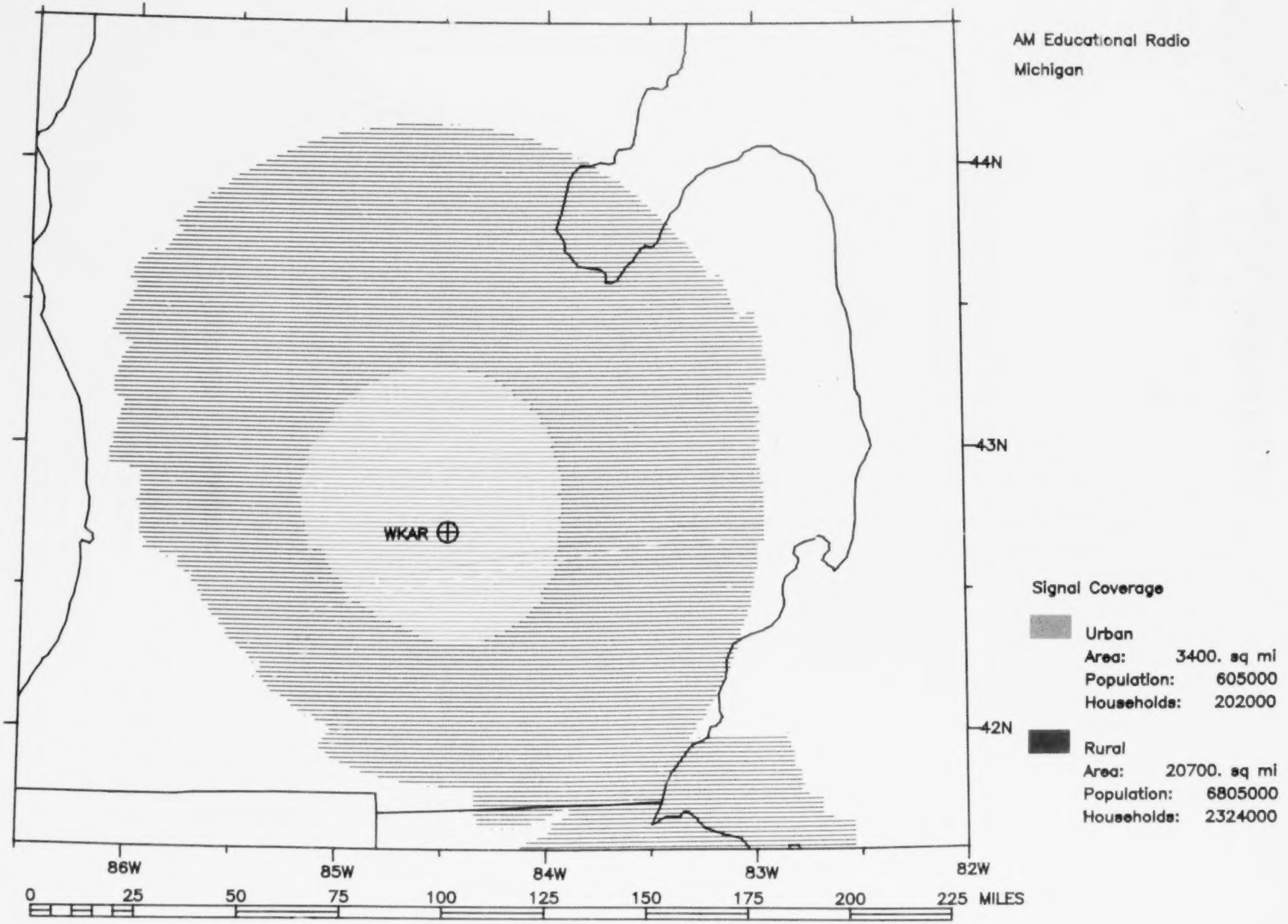
Michigan

Signal Coverage

▨	Primary (70 dBu)		
	Area:	37900. sq mi	
	Population:	7983000	
	Households:	2752000	
■	Secondary (60 dBu)		
	Area:	55400. sq mi	
	Population:	8700000	
	Households:	2998000	



AM Educational Radio
Michigan


44N
43N
42N
86W
85W
84W
83W
82W
WKAR
0
25
50
75
100
125
150
175
200
225 MILES
Signal Coverage
Urban
Area: 3400. sq mi
Population: 605000
Households: 202000
Rural
Area: 20700. sq mi
Population: 6805000
Households: 2324000

MINNESOTA

Basic Statistics

Total State Population:	4,076,000
Total Population Receiving Public Radio Signal:	3,661,000 (90%)
Total Population in Uncovered Areas:	415,000

Public Radio Stations in State

Community	Call Letters
Bemidji	KCRB-FM
Collegeville	KSJR-FM
Duluth	KUMD-FM
	KSCD-FM
Grand Rapids	KAXE-FM
Hibbing	WIRR-FM
Mankato	KMSU-FM
Minneapolis/ St. Paul	KFAI-FM
	KUOM-AM
	KSJN-FM
	KSJN-AM
	KMOJ-FM
Moorhead	KCCM-FM
Northfield	WCAL-FM
	WCAL-AM
Rochester	KLSE-FM
St. Peter	KGAC-FM
Worthington/ Marshall	KRSW-FM

General Comments

Minnesota is the northernmost of the contiguous 48 states. Most of the terrain consists of relatively flat rolling hills. Major terrain changes occur only in the Mississippi River

Valley, which runs along the southeastern border with Wisconsin. Two major metropolitan areas, (Minneapolis/St. Paul and Duluth) contain the majority of the population.

Over-the-air coverage is available to 90 percent of the residents of the state. Ten of the stations are associated with Minnesota Public Radio, which is a statewide public radio network with local affiliates.

Uncovered Areas

Region I

Even though this is a rural region, because of the proximity of multiple signals to the area, service via translators may be possible. PTFP recently awarded funds to Minnesota Public Radio to build a repeater station with local origination in the community of Appleton. This facility will provide a first public radio service to approximately 150,000 residents of Region I. We estimate that approximately two-thirds of the unserved residents of Minnesota live in Region I.

Region II

Thief River Falls is the largest town in the area. The balance of the region includes state parks and forests and the Red Lake Indian Reservation. KFJM-AM, Grand Forks, ND, can be received in some parts of this region, but at a lower signal level than used in this study. The balance of the area, near the Lake of the Woods, will probably remain unserved because of limited population and proximity to the Canadian border.

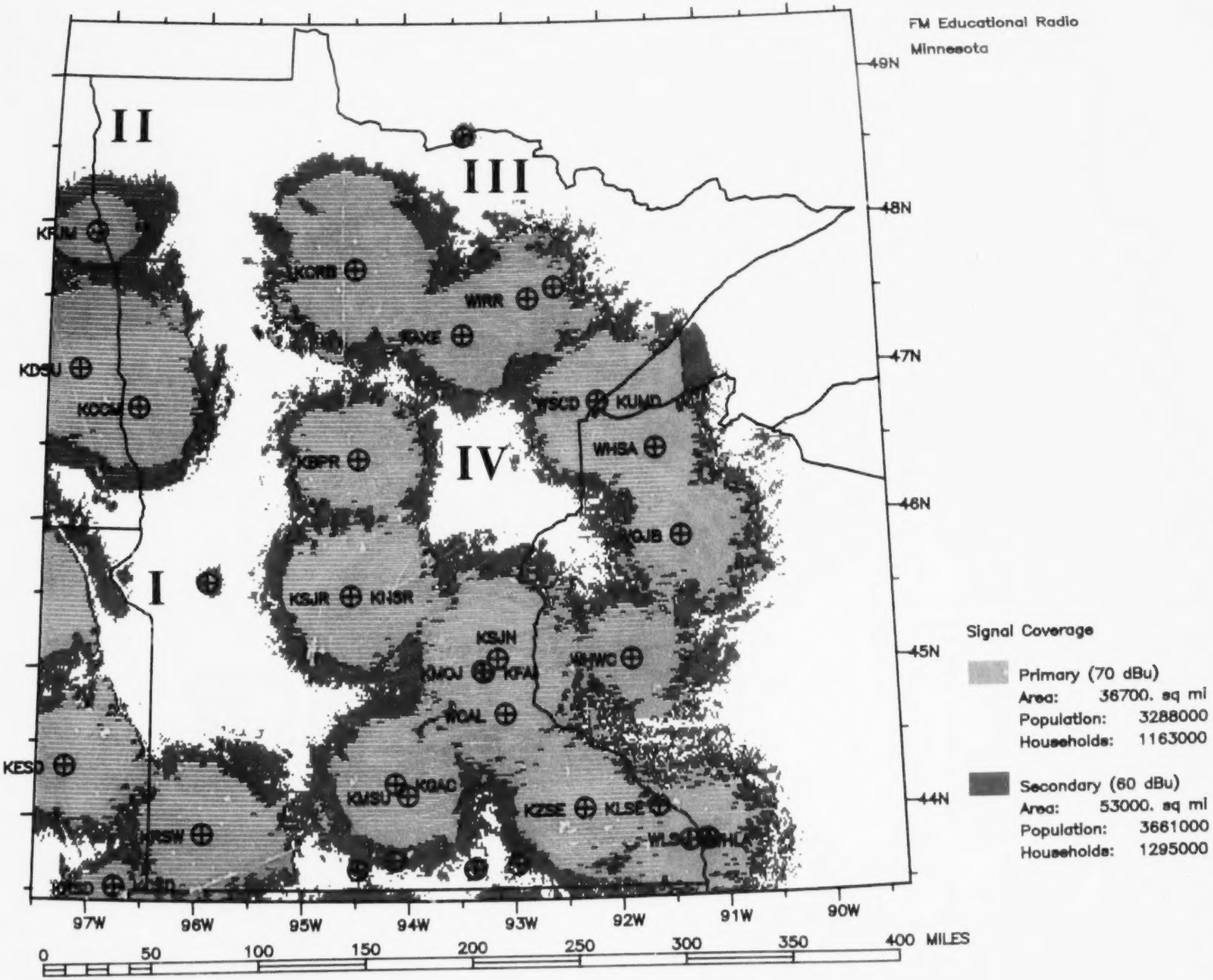
Region III

This region's primary population centers are between Grand Rapids and Ely along what used to be the Mesabi and Vermillion Iron Ranges. Much of this area is virtually unpopulated. The unserved communities are so small that it may not be possible to achieve full coverage. Proximity to the Canadian border may inhibit service extension.

Region IV

Region IV includes an Indian reservation and a recreation area. It is sparsely populated throughout. Several Rural-grade AM signals are received in the region. This AM contour strength, however, was not considered "coverage" for this study. This area could be served by extending any of the surrounding signals via translators. A repeater would provide the power to cover this area, but the population is so small that financial resources may be insufficient to support such an expensive technology.

FM Educational Radio
Minnesota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46N
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44N
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IV
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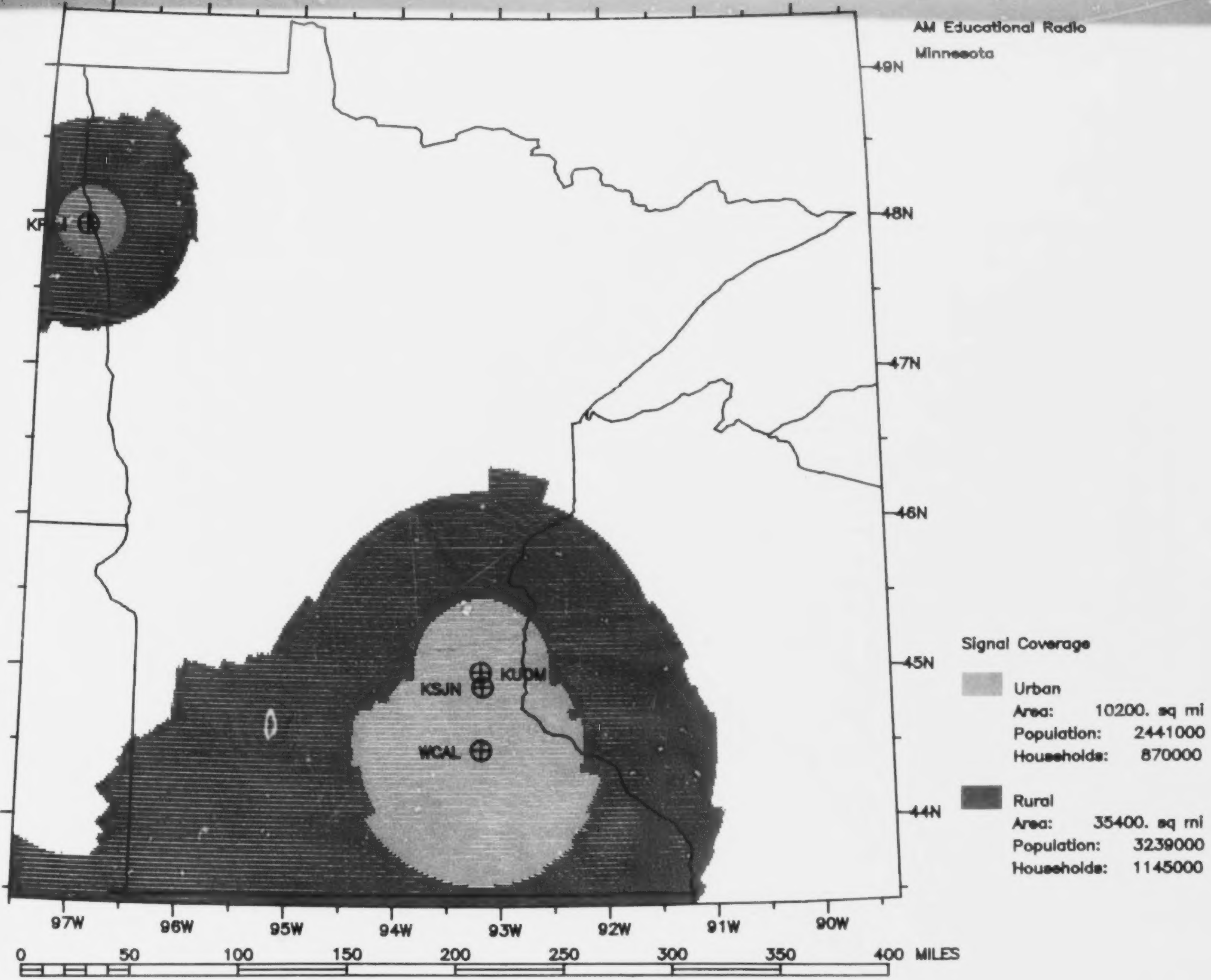
KFJM
KDSU
KCCM
KESD
KRSW
KBSD
KCRB
WIRR
KAXE
KBPR
KSJR
KNSR
WSCD
KUMD
WHSA
KQJB
KSJN
KMOJ
KFAI
WCAL
WHWC
KMSU
KGAC
KZSE
KLSE
WLSU
WHLA
97W
96W
95W
94W
93W
92W
91W
90W
0
50
100
150
200
250
300
350
400 MILES
Signal Coverage
Primary (70 dBu)
Area: 36700. sq mi
Population: 3288000
Households: 1163000
Secondary (60 dBu)
Area: 53000. sq mi
Population: 3661000
Households: 1295000

AM Educational Radio

Minnesota


49N
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97W
96W
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93W
92W
91W
90W
0
50
100
150
200
250
300
350
400 MILES
KUOM
KSJN
WCAL
Signal Coverage
Urban
Area: 10200. sq mi
Population: 2441000
Households: 870000
Rural
Area: 35400. sq mi
Population: 3239000
Households: 1145000

MISSISSIPPI

Basic Statistics

Total State Population:	2,521,000
Total Population Receiving Public Radio Signal:	2,397,000 (95%)
Total Population in Uncovered Areas:	124,000

Public Radio Stations in State

Community	Call Letters
Biloxi	WMAH-FM
Booneville	WMAE-FM
Bude	WMAU-FM
Greenwood	WMAO-FM
Hattiesburg	WMSU-FM
Jackson	WJSU-FM WMAA-FM WMPR-FM
Lorman	WPRL-FM
Meridian	WMAW-FM
Miss. State	WMAB-FM
Oxford	WMAV-FM
Senatobia	WNJC-FM

General Comments

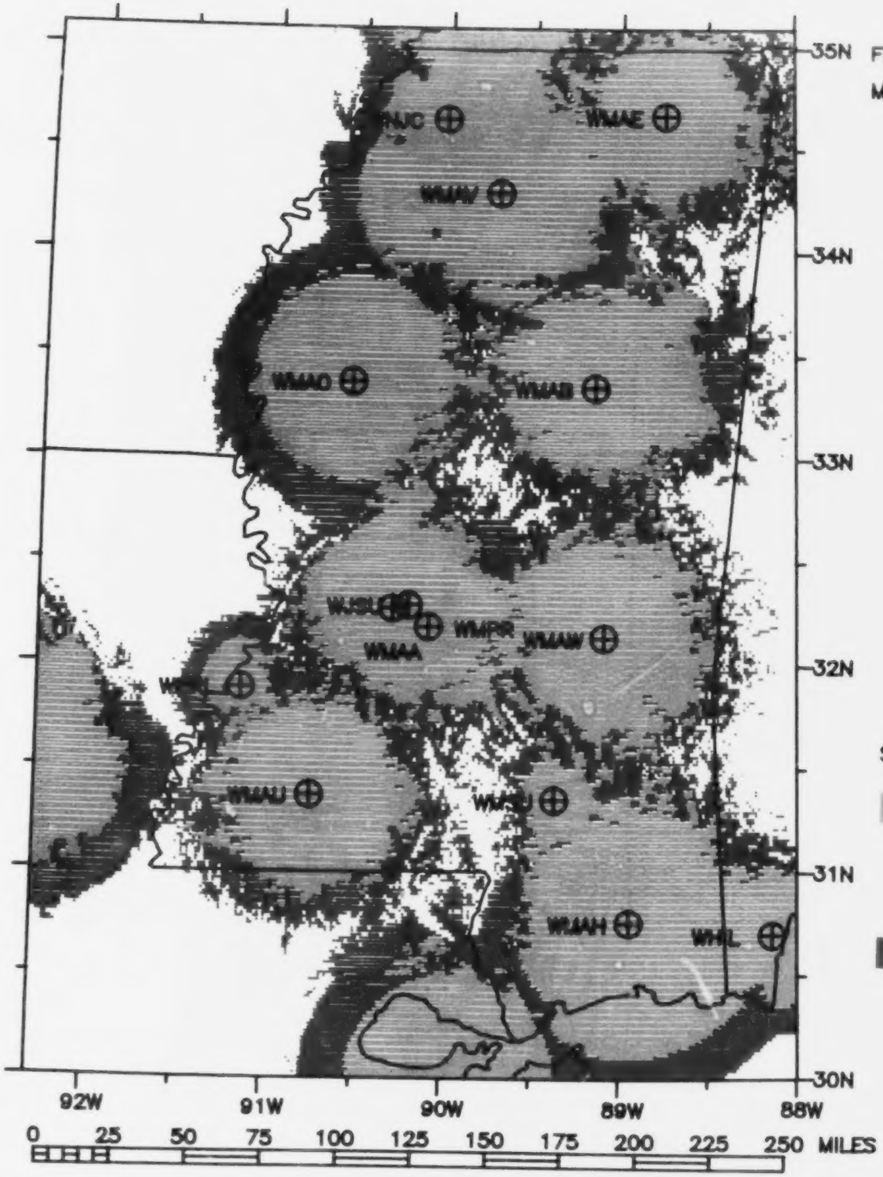
In Mississippi, public radio coverage developed as a complement to the statewide public television network. The state public radio plan provided a public radio network that could utilize major components of the state's public television network (i.e., radio antennas are located on the public television towers). This master plan has resulted in the delivery of at least one public radio signal to the majority of the residents of Mississippi. Mississippi's public radio network, based in Jackson, feeds seven repeater stations which provide statewide coverage. In addition to the state network, several universities and colleges are licensed to operate public radio stations.

Uncovered Areas

Although several small pockets along the western and eastern state borders are shown on the map as not being covered with either a network or non-network public radio signal, a state public radio official indicated that a reliable signal is received in these areas.

FM Educational Radio

Mississippi


35N
34N
33N
32N
31N
30N
92W
91W
90W
89W
88W
0
25
50
75
100
125
150
175
200
225
250
MILES
WMAE
WMAV
WMAO
WMAB
WJSU
WMPR
WMAA
WMAW
WMAU
WMAH

Signal Coverage

▨ Primary (70 dBu)
Area: 34700. sq mi
Population: 1997000
Households: 656000

■ Secondary (60 dBu)
Area: 44500. sq mi
Population: 2397000
Households: 787000

MISSOURI

Basic Statistics

Total State Population:	4,917,000
Total Population Receiving Public Radio Signal:	3,911,000 (80%)
Total Population in Uncovered Areas:	1,006,000

Public Radio Stations in State

Community	Call Letters
Buffalo	KBFL-FM
Columbia	KBIA-FM KOPN-FM
Kansas City	KCUR-FM KKFI-FM
Maryville	KXCV-FM
Point Lookout	KSOZ-FM
Rolla	KUMR-FM
Springfield	KSMU-FM
St. Louis	KDHX-FM KWMU-FM
Warrensburg	KCMW-FM

General Comments

All heavily populated areas are receiving reliable signals. The unserved areas tend to be rural and sparsely populated. Missouri has no state public radio system. All the stations listed above are autonomous.

Missouri public radio service is enhanced to some degree by out-of-state signals. To the east, two Illinois stations -- WSIE-FM, Edwardsville, and WSIU-FM, Carbondale -- push into Missouri. In the extreme southeast, part of the state's "boot-heel" is reached by the contours of KASU-FM, Jonesboro, AR. In the southwest, the signal of KRPS-FM, Pittsburg, KS, protrudes substantially into the state.

Uncovered Areas

Many Missouri public radio officials expressed scepticism about the practicality of extending public radio to the remaining sparsely-populated communities in the state because of the lack of a sufficient financial base.

Missouri's unserved areas may be divided into three major regions.

Region I

Region I, which is virtually the entire northern part of the State, is very rural and sparsely populated. In addition, it has been victimized by an economic recession in recent years. This militates against it's receiving public radio service in the near future. If and when it ever does receive service, economic factors will doubtlessly determine whether it will be via major satellite repeater (as the terrain would allow) or by translators (which would be less costly). About 25 percent of the state's unserved residents live in this region.

The accompanying AM radio map shows that the Rural-grade contour of the signal from WOI-AM, Ames, Iowa, reaches rather deeply into northern Missouri. WOI-AM is licensed to Iowa State University. Its signal may be received in Missouri with fair reliability during the daytime hours. At night, however, WOI-AM reduces its power from its daytime 5kw to 1kw and uses a directional antenna with the signal pointed east. With these changes, its signal does not reach Missouri.

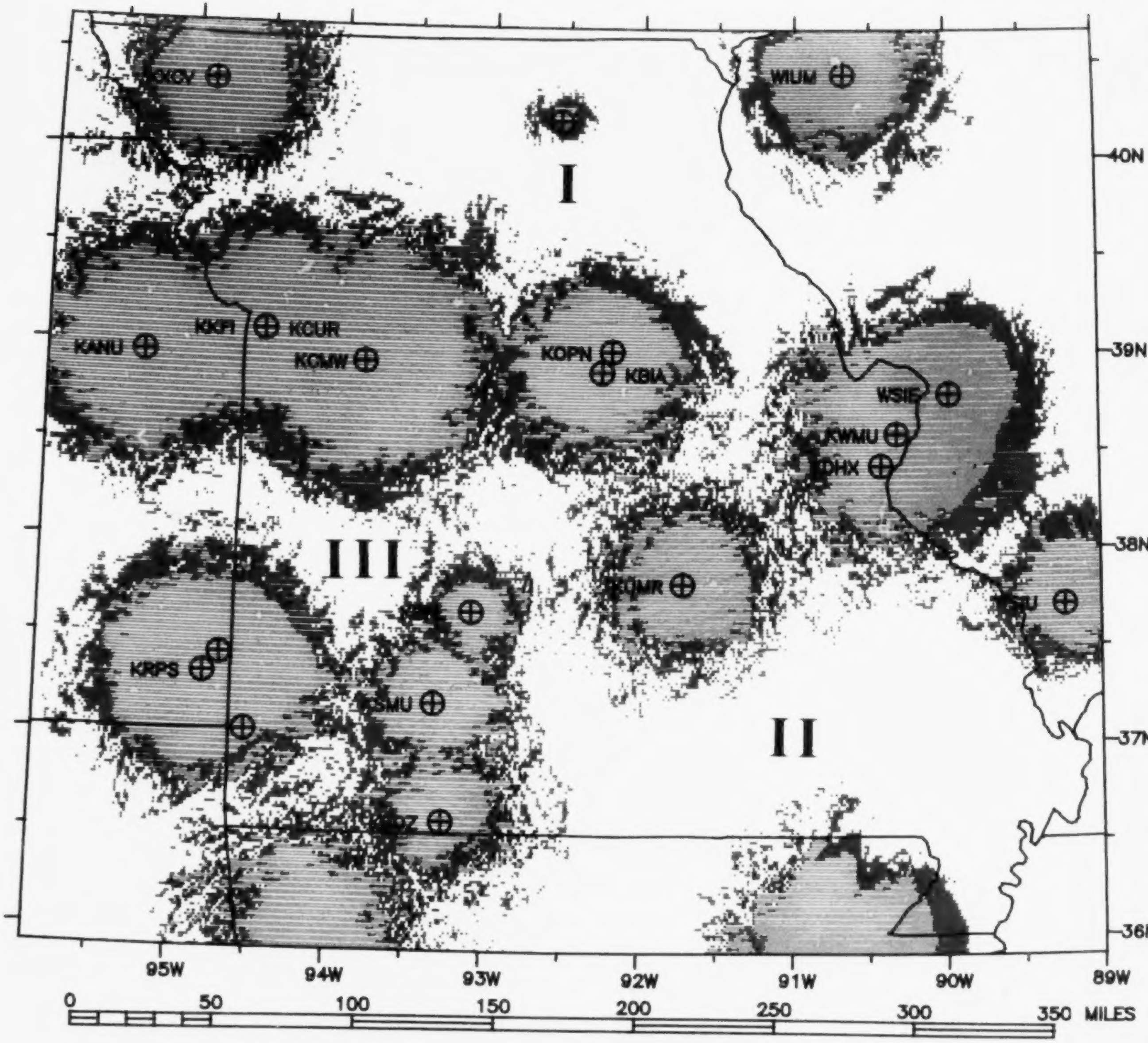
Region II

Region II is the southeast quadrant. The greater part of this region consists of vast national forest lands and, as one might expect, is very sparsely populated. It is unlikely that this area will receive public radio coverage soon because of the lack of an economic base and the distances involved. Approximately 400,000 people live in this region but they are, of course, spread out over a vast area.

Southeast Missouri State University, of Cape Girardeau, has applied to the FCC to upgrade its transmission power from 100 w to 5 kw. Moreover, it has filed for Auxiliary Membership in National Public Radio. If it increases its power as it plans, then its signal will reach the fringes of Sikeston, Charleston and Perryton. In this part of Region II, the terrain is least mountainous. If this service is implemented, a series of translators might extend public radio to the rest of the section.

Region III

Region III is the serpentine-shaped area in the southwest. The entire region tends to have a low population density. The area south and southwest of Rolla, for example, has a substantial amount of national forest. In the western part of this region, translators may bring signals to some of the more populated locations; e.g., the Lake of the Ozarks region. Also, KCMW-FM, in Warrensburg, may change its antenna site in a manner that would quite likely diminish the "white space" to the south of its present contours.


KXCV
WIUM
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KOPN
KBIA
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KWMU
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KRPS
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39N
38N
37N
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95W
94W
93W
92W
91W
90W
89W
0
50
100
150
200
250
300
350 MILES

FM Educational Radio
Missouri

Signal Coverage

▨ Primary (70 dBu)

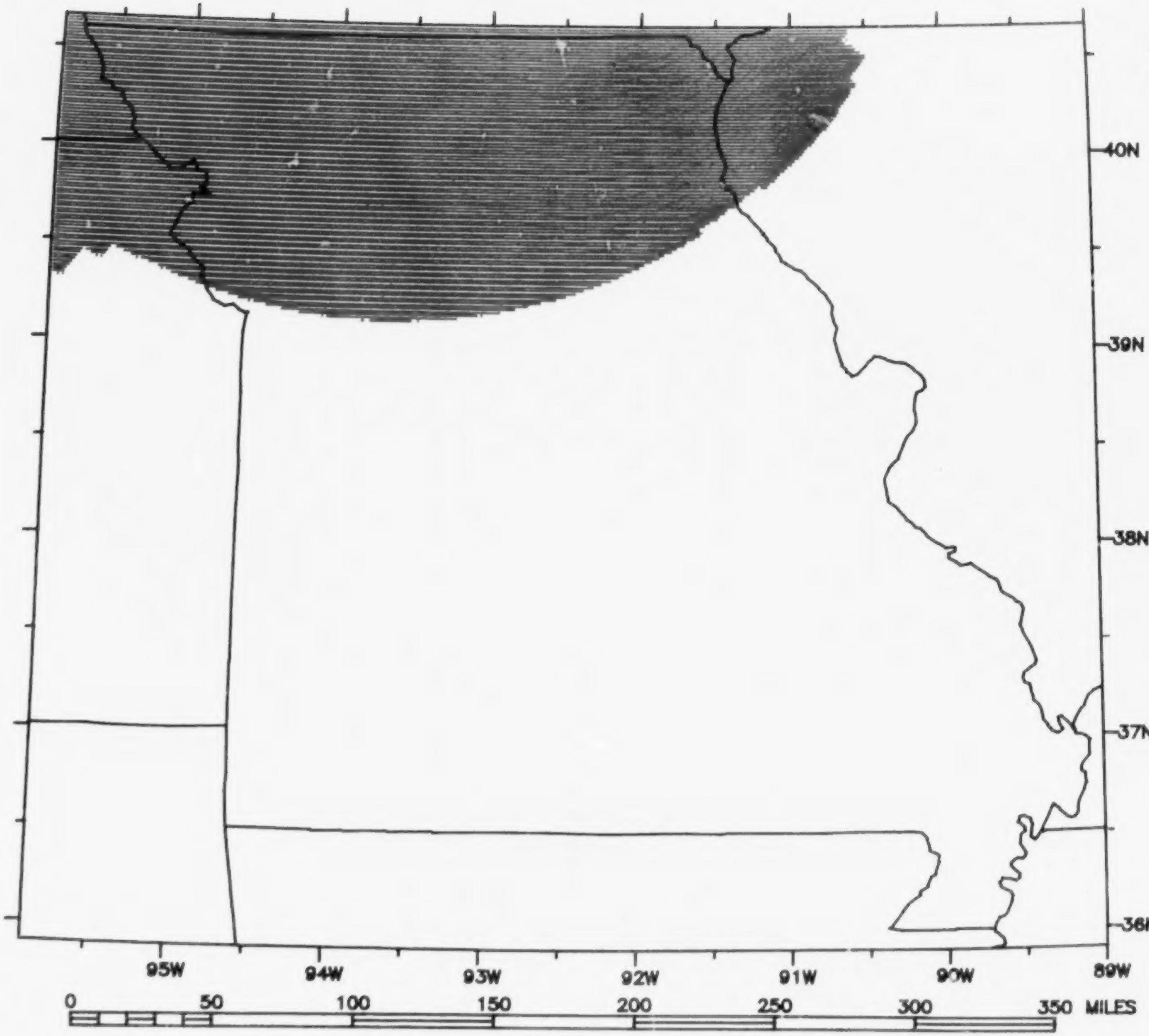
Area:	23300. sq mi
Population:	3495000
Households:	1261000

■ Secondary (60 dBu)

Area:	35600. sq mi
Population:	3911000
Households:	1414000

AM Educational Radio

Missouri


40N
39N
38N
37N
36N
95W
94W
93W
92W
91W
90W
89W
0
50
100
150
200
250
300
350 MILES

Signal Coverage

▨ Urban
Area: 0. sq mi
Population: 0
Households: 0

▨ Rural
Area: 17900. sq mi
Population: 634000
Households: 238000

MONTANA

Basic Statistics

Total State Population:	787,000
Total Population Receiving Public Radio Signal:	376,000 (48%)
Total Population in Uncovered Areas:	411,000

Public Radio Stations in State

Community	Call Letters
Billings	KEMC-FM
Great Falls	KGPR-FM
Missoula	KUFM-FM

General Comments

Montana is essentially two states. Each poses distinct problems for the broadcast systems planner. The eastern two-thirds of the state consists of spacious plains, with few major population centers. The vast distances separating the few well-populated locations constitute barriers to public radio extension. Moreover, the sparse population heightens the economic risk in establishing public radio entities.

Mountains and expansive areas of national forests dominate the western third of Montana, although most of the state's major communities -- and most of its public radio signals -- are to be found there. Such rugged terrain brings its own formidable radio extension problems.

The public radio stations are autonomous, there being no state system. Station KGPR-FM, in Great Falls, however, is a satellite repeater of KUFM-FM, Missoula. Very little coverage in Montana is attributable to out-of-state signals, although the community of Sidney, in the northeast, receives coverage from the North Dakota state system's repeater station in Williston, North Dakota.

Not all of Montana's public radio coverage is reflected on the accompanying map. For varied reasons, some public radio translators were not plotted. The following Montana communities are served by FM translators not depicted on the map: in the west -- Swan Lake/ Ferndale, Rattlesnake/N. Missoula, Marysville/Three Mile Creek, and White Sulphur Springs; toward the east -- Colstrip, Lewistown, Livingston, Glendive, Big Timber, and Chester.

Consideration of this coverage would of course raise the percentage of Montana's population covered above the 48 percent calculated by this study. (Those calculations were based on the stations plotted on the map.) Due to the low power of translators, it is not likely that the coverage percentage would increase much more than about three percent.

Uncovered Areas

Region I

Region I is composed of mountains and national forest lands. It is sparsely populated. Because of these factors, it may not be practical to provide public radio to the entire region. At the eastern extreme of this region, in Bozeman, KEMC-FM is planning to upgrade its translator to the status of repeater station, much as it has already done in Miles City. Approximately 25 percent of the state's unserved population resides in this region.

Region II

This area includes the Lolo, Kootenai and Flathead National Forests as well as Glacier National Park. The only populated sections which are not presently served by a public radio signal are the Kalispell, Whitefish, and the Flathead Reservation areas, which total nearly 50,000 people. Because of the mountainous nature of the region and the distance from an originating signal, even translator service may be difficult to provide.

Region III

On April 1, 1989, Northern Montana College placed an FM translator on-air in Havre, rebroadcasting KEMC's signal via an existing translator at Chester. With this development, the area from Shelby to Havre enjoys fairly reliable service. The remainder of this "northern tier" will have little public radio service. PTFP has attempted to develop a number of public radio service projects in the area with community colleges and Indian tribal organizations. However, the region continues to be without service. The primary inhibitive factor is the proximity to the Canadian border. The Canadian reserve channels significantly reduce the number of protected noncommercial education channels available.

Another problem, however, is the great distance that separates the Montana originating stations from much of this region, especially the eastern part. Because of this, the North Dakota state public radio system, via its major repeater station in Williston, ND, might reach parts of this unserved region better than the Montana stations could.

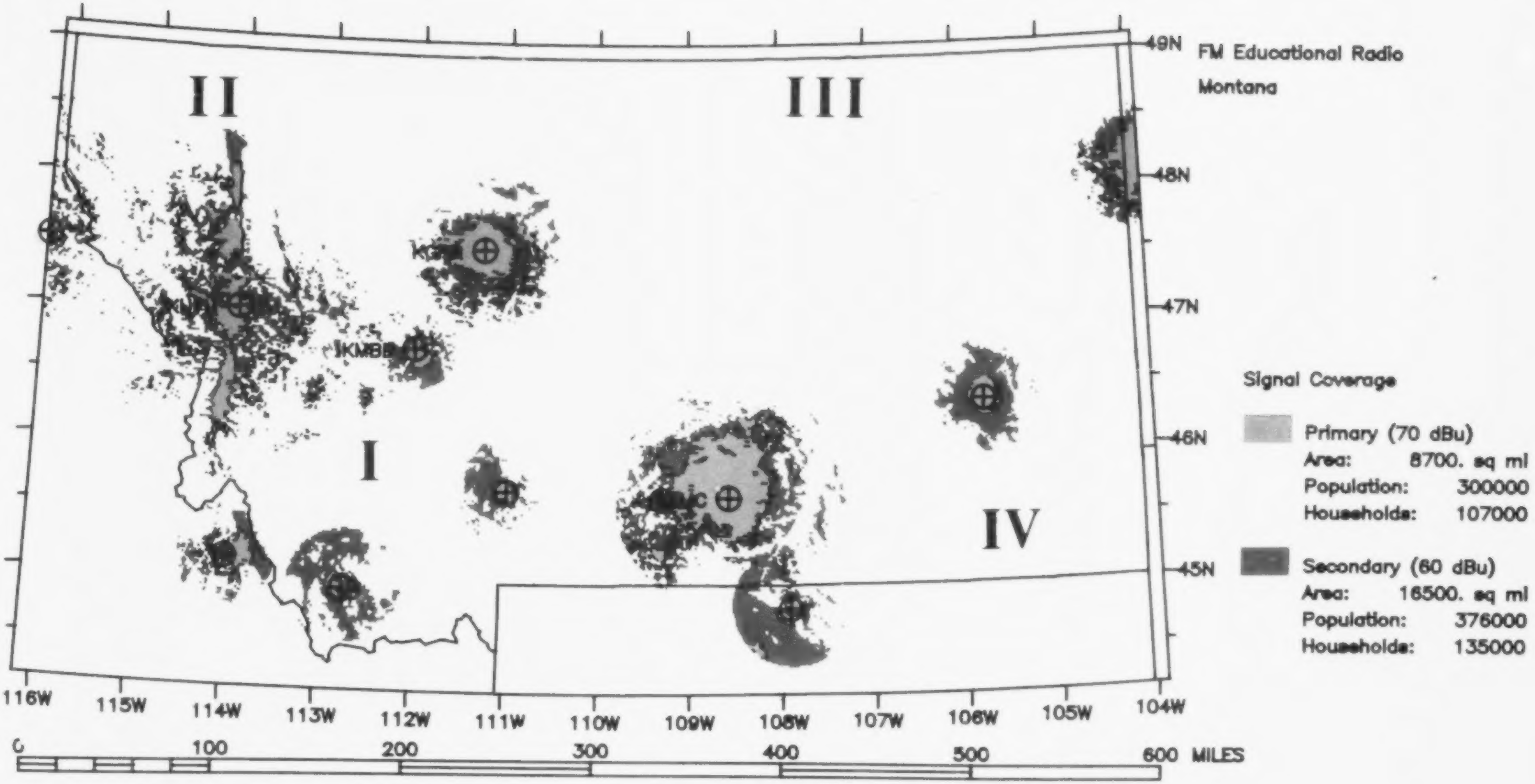
We calculate that approximately 35 percent of Montana's unserved population lives in this vast region.

Region IV

Region IV is Montana's southeast quadrant. The population, which constitutes only about 15 percent of the state's unserved residents, has an extremely low density. For example, the total population of Powder River, Carter, Fallon, and Wibaux Counties is about 10,000. The region's population centers lie along Interstate Rte. 94. Many of these centers have FM public radio service from facilities retransmitting the signal of KEMC-FM. The translator in Miles City was recently upgraded to a 500 w station. This allows for a local origination capability. The new station also transmits a more reliable signal to the FM translator at Glendive. Public radio extension to the rest of this region -- i.e., the areas away from I-94 -- will be greatly hindered by the sparse population and, in some locations, the distances involved. (The communities of Ashland and Broaddus have expressed interest in receiving KEMC by translator, but field strength readings have suggested that the KEMC signal may be too weak there for reliable reception.) Extension, then, when and if it comes, will almost certainly take the form of either translators or low-power stations repeating the KEMC signal with local inserts.

FM Educational Radio

Montana



49N
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108W
107W
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104W
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400
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600 MILES
I
II
III
IV
KMBB
Signal Coverage
Primary (70 dBu)
Area: 8700. sq mi
Population: 300000
Households: 107000
Secondary (60 dBu)
Area: 16500. sq mi
Population: 376000
Households: 135000

NEBRASKA

Basic Statistics

Total State Population:	1,570,000
Total Population Receiving Public Radio Signal:	891,000 (57%)
Total Population in Uncovered Areas:	679,000

Public Radio Stations in State

Community	Call Letters
Lincoln	KUCV-FM KZUM-FM
Omaha	KIOS-FM KVNO-FM

General Comments

Nebraska is at a turning point with respect to public radio. At the moment, only about half of the state's population receives a full-service public radio signal. The state, however, has embarked on an ambitious plan to cover the remainder of the population within the next few years. This will be explained in more detail below.

Nebraska's two major cities, Lincoln and Omaha, are totally covered by public radio. To a great degree, this is attributable to the stations listed above. However, KIWR-FM, licensed to Iowa Western Community College in Council Bluffs, also covers Omaha. In addition, KWIT-FM, operated by Western Iowa Technical Community College in Sioux City, reaches into the far northeast corner of Nebraska. Finally, the signal of KILI-FM serves a small, extremely remote area of northwest Nebraska. KILI, which is operated by Lakota Communications, Inc., from the South Dakota Pine Ridge Indian Reservation, offers programming designed in good part to meet the needs of the Sioux people.

Uncovered Areas

As noted above, Nebraska has begun the process through which the entire state will eventually be reached by public radio. The agency carrying out this process is the

Nebraska Educational Telecommunications Commission (NETC), which has its headquarters in Lincoln. NETC administers the state's extensive public television system and it is that system's towers that will provide the basis for the public radio network.

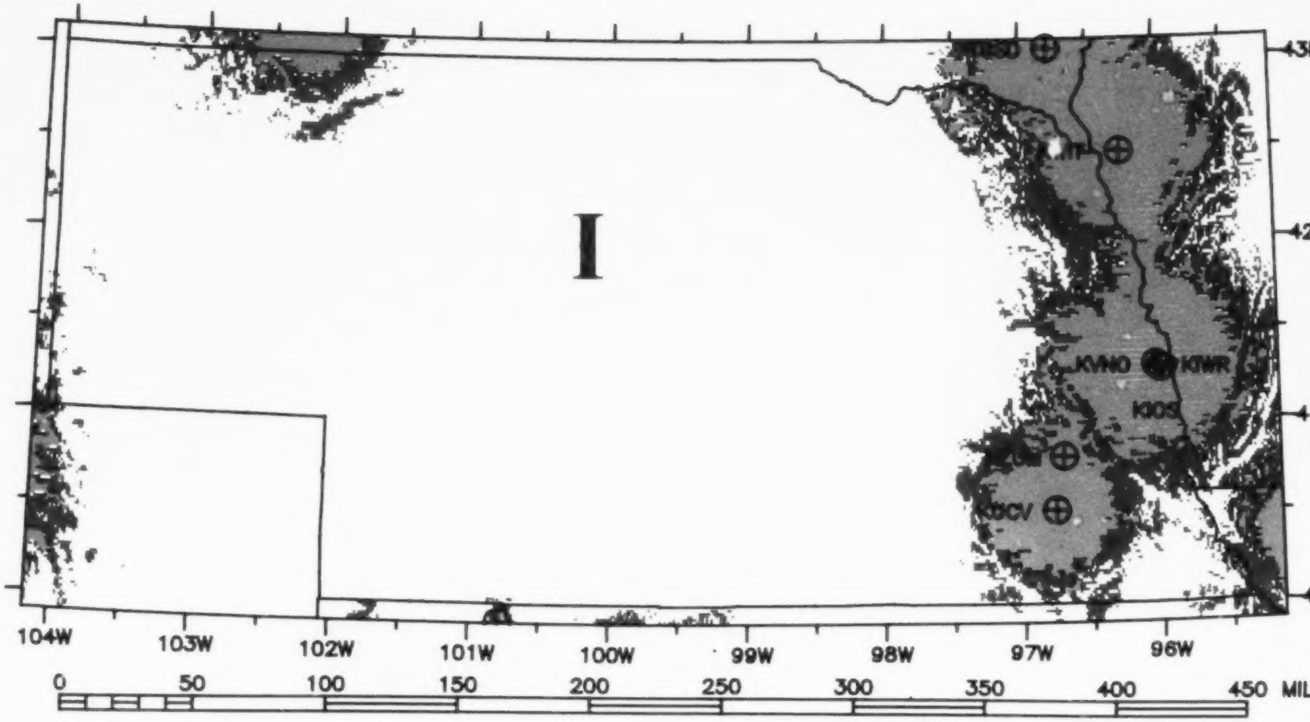
Planning for the proposed state system has been completed. As now configured, the master plan calls for the construction of nine new major repeater stations. Although the stations will have different power levels, none will be low-power. They will be located in Alliance, Bassett, Chadron, Falls City, Hastings, Lexington, Merriman, Norfolk, and North Platte. All these communities are sites of NETC public television stations or TV translators. The new radio stations will be interconnected by microwave, again taking advantage of facilities already in place.

According to the plan, the new stations will be constructed as the communities to be served can raise the funds necessary to purchase the equipment or to meet nonfederal share requirements of PTFP construction grants. The first phase embraces the stations at Alliance, Hastings, Lexington, and Norfolk. These are the subject of a Fiscal Year 1989 PTFP construction grant application.

When the new stations are finally in operation, the NETC will perform tests to determine which communities may be receiving unreliable signals. If any such communities are identified, then the NETC will consider activating FM translators to resolve the problem. This was the approach the NETC took in covering the state with public television signals and the result is that virtually all the state's residents now receive these signals. It is assumed that within the next five years or so, the same will be true of public radio.

The state system will offer a full range of national programming. KUCV-FM, Lincoln, will serve as the system's flagship station; KUCV, which for many years was licensed to Union College, is now operated by the NETC. Also, KVNO, Omaha, will be closely affiliated with the system. KUCV and KVNO will produce a statewide programming service. Local programs will originate from the four state colleges in Chadron, Kearney, Peru and Wayne as well as from other academic institutions -- both public and private -- throughout the state.

FM Educational Radio
Nebraska


43N
42N
41N
40N
104W
103W
102W
101W
100W
99W
98W
97W
96W
0
50
100
150
200
250
300
350
400
450 MILES
I
KVNO
KIWR
KIOS
KUCV

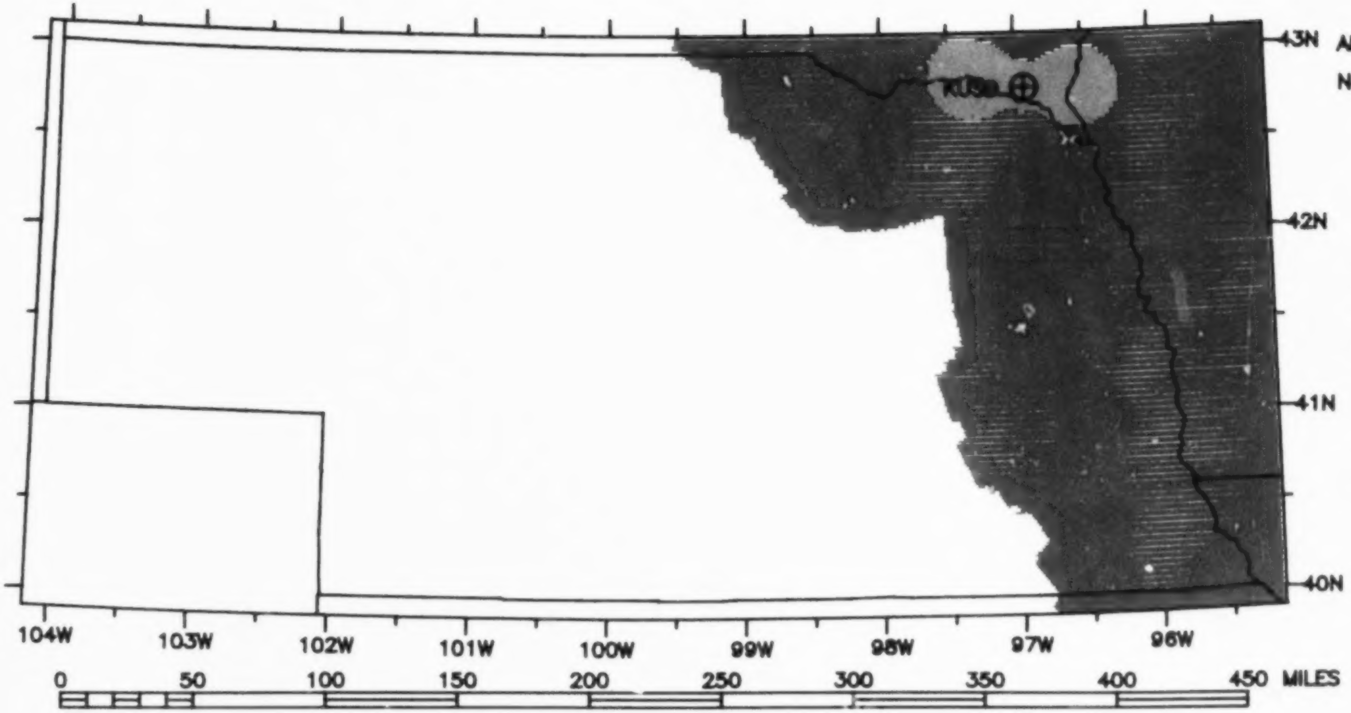
Signal Coverage

▨ Primary (70 dBu)
Area: 7200. sq mi
Population: 807000
Households: 285000

■ Secondary (60 dBu)
Area: 11800. sq mi
Population: 891000
Households: 317000

AM Educational Radio

Nebraska


KUSD
43N
42N
41N
40N
104W
103W
102W
101W
100W
99W
98W
97W
96W
0
50
100
150
200
250
300
350
400
450 MILES

Signal Coverage

▨ Urban
Area: 400. sq mi
Population: 10000
Households: 3000

▨ Rural
Area: 18300. sq mi
Population: 1038000
Households: 370000

NEVADA

Basic Statistics

Total State Population:	800,000
Total Population Receiving Public Radio Signal:	693,000 (87%)
Total Population in Uncovered Areas:	107,000

Public Radio Stations in State

Community	Call Letters
Las Vegas	KNPR-FM KCEP-FM
Reno	KUNR-FM

General Comments

Eighty percent of the population of Nevada resides in the two major metropolitan areas of Reno/Carson City and Las Vegas. A second corridor of population is found along Interstate Route 80 which crosses the northern part of the state. A good part of Nevada, however, is mountainous and so the state has numerous areas that are virtually unpopulated. The majority of the population receives a radio signal.

Regarding the development of public radio, the two major metropolitan areas are served by three public radio stations: KUNR-FM in Reno and KCEP-FM and KNPR-FM, Las Vegas. Some smaller towns and cities in the state are served by translators of the larger stations. This system of translators has even allowed some of remote communities to develop their own local origination capacity. For example, the Tonapah and Panaca repeaters of KNPR-FM, Las Vegas, are fed by microwave but each has a local studio. This configuration, called the "Rocky Mountain Alternative Station," is becoming a model for cost-effective delivery of public radio service to remote areas the populations of which may be too small to support full-service stations.

Uncovered Areas

Region I

The northern sections of Washoe County and Humboldt County have only one major community. It is Winnemucca (population 4,140), which is served by an FM translator rebroadcasting the signal of KUNR-FM, Reno. The balance of the towns in Region I are mining sites or settlements with limited financial resources. This may prevent development of public radio services.

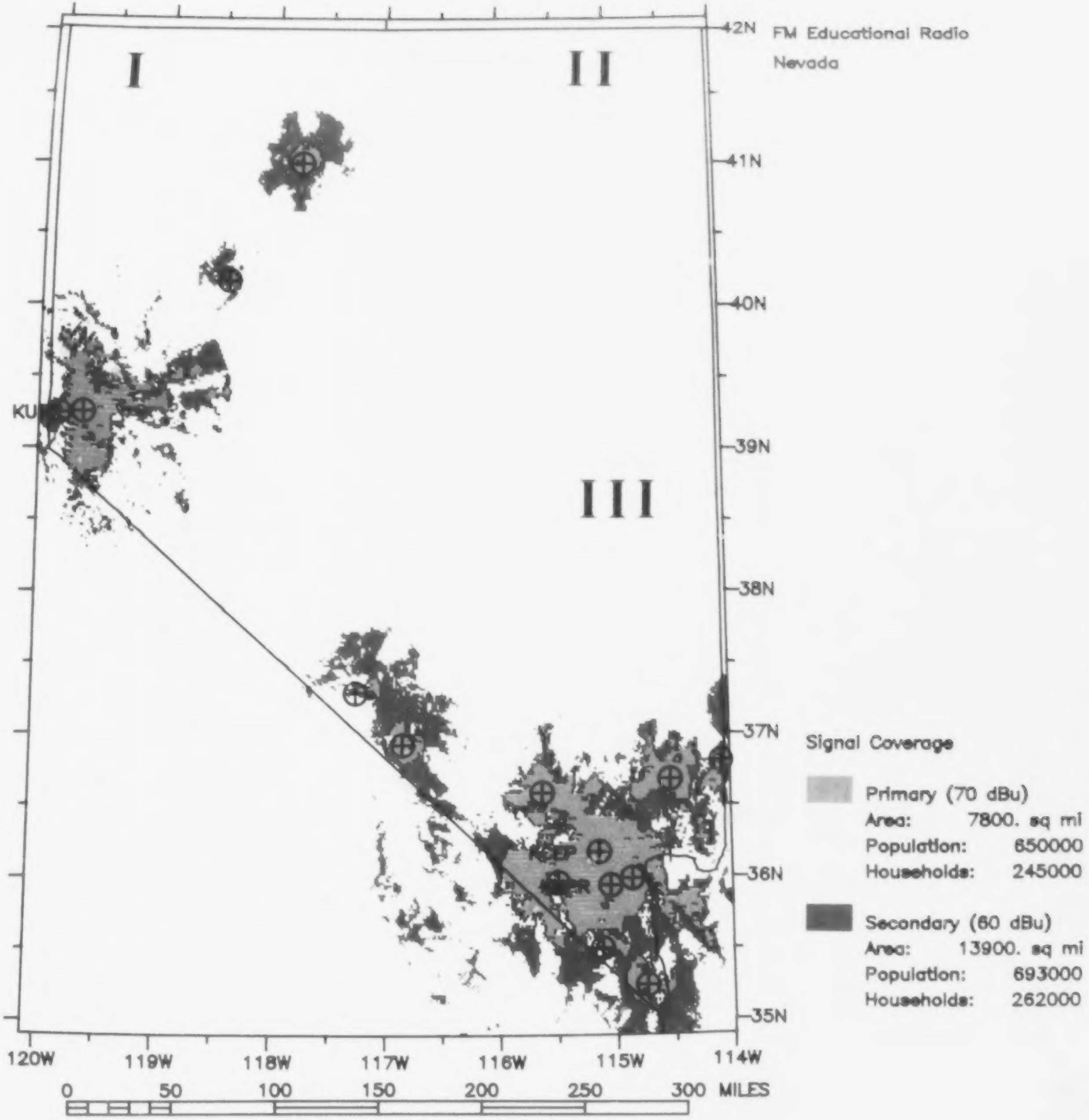
Region II

Region II comprises the northeast corner of the state, encompassing Elko County and parts of Humboldt, Pershing, Lander and Eureka Counties. The region is similar to the Humboldt/Washoe area in that the only populated locations are along Interstate Route 80. The projected extension of translator service along this corridor has been planned by KUNR-FM. The installation of some translators has already occurred. Perhaps about one-third of Nevada's unserved population resides in this region.

Region III

Region III embraces White Pine, Lincoln, Nye, and Mineral Counties and parts of Churchill, Eureka and Lander Counties. The area is mountainous and very sparsely settled. The only town in this area with over 300 people is Ely. The rest of the area is mountainous desert with few towns large enough to support translators. The public radio station in Reno has indicated that in the near future it will attempt to provide service to Ely. We have estimated that up to sixty percent of the state's unserved residents live in this vast area.

FM Educational Radio
Nevada


I
II
III
KU
KCEP
42N
41N
40N
39N
38N
37N
36N
35N
120W
119W
118W
117W
116W
115W
114W
0
50
100
150
200
250
300 MILES
Signal Coverage
▨ Primary (70 dBu)
Area: 7800. sq mi
Population: 650000
Households: 245000
■ Secondary (60 dBu)
Area: 13900. sq mi
Population: 693000
Households: 262000

NEW HAMPSHIRE

Basic Statistics

Total State Population:	921,000
Total Population Receiving Public Radio Signal:	746,000 (81%)
Total Population in Uncovered Areas:	175,000

Public Radio Stations in State

Community	Call Letters
Concord	WEVO-FM

General Comments

Granite State Public Radio (GSPR), licensee of WEVO-FM in Concord and a translator in Nashua, is the only in-state provider of public radio in New Hampshire, although some parts of the state receive signals from Maine and Vermont.

Uncovered Areas

The majority of the "white space" is found in New Hampshire's unpopulated mountainous region, where terrain prevents reliable signal reception. The northern third of this state is a sparsely populated mountainous region. The topography of the southwest portion of the state consists of hills and valleys. The "white space" in the upper central part of the state is the White Mountain National Forest and terrain is rugged. It is also sparsely populated. In several populated areas public radio reception is spotty.

Region I

Region I, the northern third of New Hampshire, is by and large coextensive with Coos County. We have calculated that it contains approximately 25,000 to 30,000 unserved persons. It is a sparsely populated and mountainous area.

Region II

Region II is the northeastern coastal portion of the state near Portsmouth. The irregular pattern of the coverage in this region presents severe difficulties in assessing the number of residents who remain unserved. Our best estimate is that about half of New Hampshire's total unserved population reside in this region.

Region II is without public radio because of a channel 6 problem. GSPR has applied for an 80-90 frequency assigned to Somersworth, a community near Portsmouth. There are, however, two competitors and with no preference, it is the assessment of the General Manager that GSPR will be unable to survive the expense of the comparative hearing process.

Region III

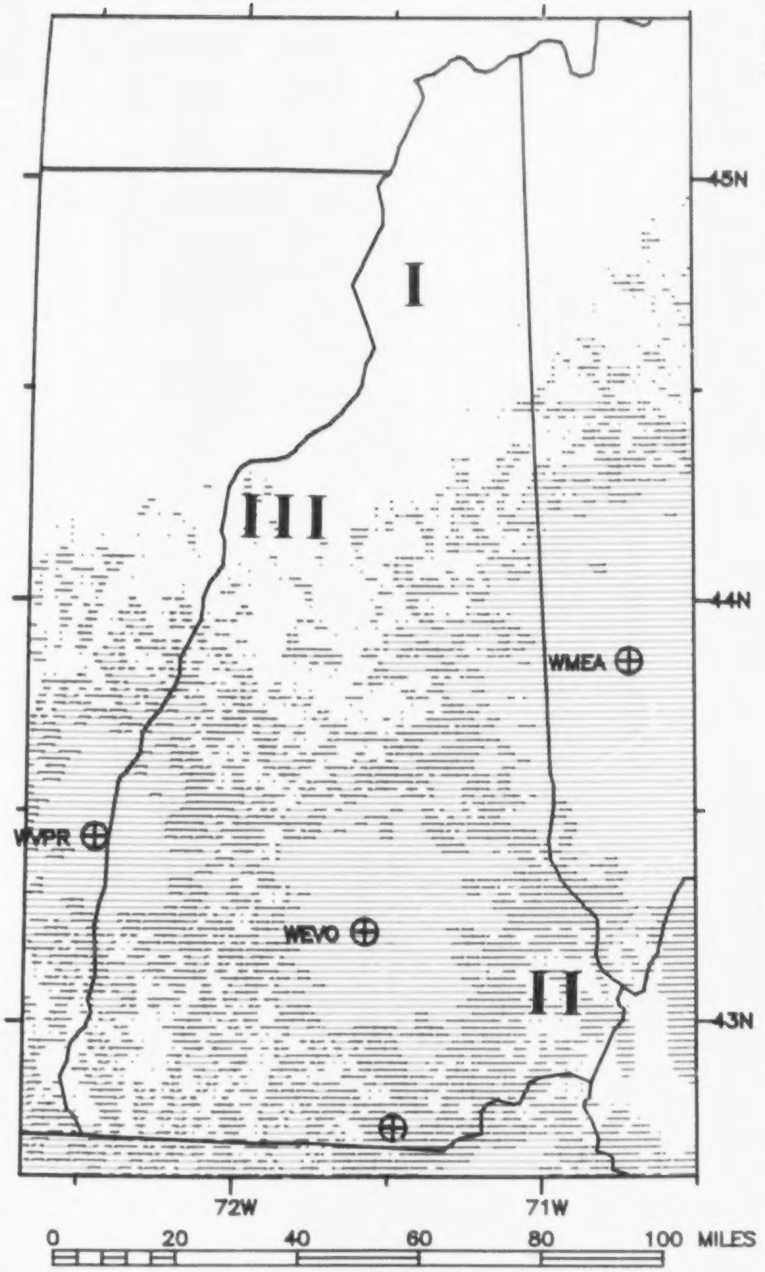
Region III consists of the west central part of the state. Approximately 60,000 of the state's unserved residents live in this region. Region III includes Littleton, which is the northernmost unserved major population center. Providing public radio service to this community may be difficult. It is located in a valley surrounded by mountains. Translators are too low in power to be desireable. A repeater transmitter would be most effective; however, channel 6 problems would be encountered.

Region IV

GSPR is currently involved in efforts to provide programming to Region IV, which is the southwest Keene area. The unserved area is in a valley. An application for an 800 watt repeater station with an antenna height of 1000 feet has been filed with the FCC; however, local frequency issues are involved. There is no accurate projection regarding anticipated FCC clearance.

Near the southern border of the state, Nashua currently receives WEVO's signal via a translator. This situation is an illustration of the secondary nature of translator service. In order to guarantee uninterrupted service, WEVO recently moved to another frequency after a religious station applied for a full-power repeater on WEVO's original translator frequency. Because of a channel 6 problem, a full-power station is not possible here.

FM Educational Radio
New Hampshire


45N
44N
43N
I
III
II
WMEA
WVPR
WEVO
72W
71W
0
20
40
60
80
100 MILES

Signal Coverage

░ Primary (70 dBu)
Area: 3400. sq mi
Population: 394000
Households: 139000

▓ Secondary (60 dBu)
Area: 5700. sq mi
Population: 746000
Households: 260000

NEW JERSEY

Basic Statistics

Total State Population:	7,365,000
Total Population Receiving Public Radio Signal:	6,237,000 (85%)
Total Population in Uncovered Areas:	1,128,000

Public Radio Stations in State

Community	Call Letters
New Jersey	WBGO-FM
Trenton	WWFM-FM

General Comments

Although it is clear that a high percentage of New Jersey's population receives public radio, a substantial portion of the state is without a reliable signal. Two independent radio stations serve the state.

Uncovered Areas

The unserved areas of New Jersey may be divided into two regions.

Region I

Region I, in the northwest, is unserved because of terrain. It is sparsely populated. However, population centers increase in frequency as the region extends south. Topography is clearly a major reason for the "white area." Additionally, there may also be problems with FCC regulations.

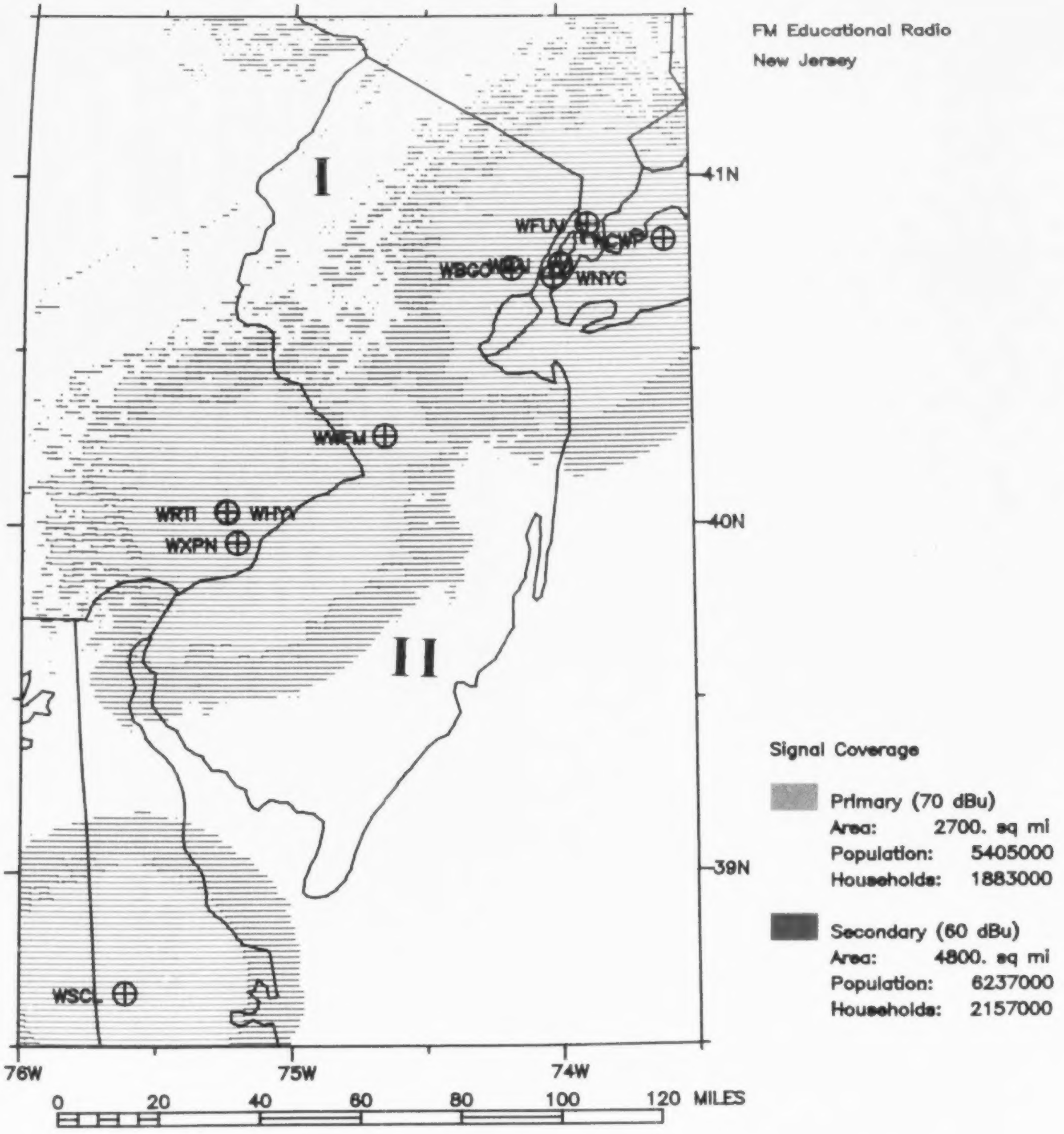
Region II

Region II includes Vineland and Atlantic City, the two most populous cities in the area. Much of the area is rural. We estimate that approximately sixty percent of the state's unserved population resides in this region. In 1984, WBGO-FM was awarded a grant from NTIA to plan service for this region. It was found, however, that a channel 6 problem from WPVI-TV in Philadelphia prevented the establishment of radio in the noncommercial band. Under current FCC rules, unless an agreement is reached with WPVI-TV, Region II will remain unserved. If an agreement could be reached, a properly placed full-service station could provide a public radio signal to a sizable portion of the southern part of this New Jersey region as well as to the unserved portion of Delaware.

Assuming no other problems, a second scenario for the northern part of the Region II would be to increase power of WWFM-FM and to add translators to cover the remaining unserved populated areas. Of course, a careful analysis of FCC and other issues would be necessary before a specific plan could be adopted.

FM Educational Radio

New Jersey


41N
40N
39N
76W
75W
74W
0
20
40
60
80
100
120 MILES
I
II
WFUV
WCWP
WBGO
WNYC
WWFM
WRTI
WHYY
WXPN
WSCL
Signal Coverage
▨ Primary (70 dBu)
Area: 2700. sq mi
Population: 5405000
Households: 1883000
■ Secondary (60 dBu)
Area: 4800. sq mi
Population: 6237000
Households: 2157000

NEW MEXICO

Basic Statistics

Total State Population:	1,303,000
Total Population Receiving Public Radio Signal:	1,054,000 (81%)
Total Population in Uncovered Areas:	249,000

Public Radio Stations in State

Community	Call Letters
Alamo	KABR-AM
Albuquerque	KANW-FM KUNM-FM
Dulce	KJAT-FM
Farmington	KSJE-FM
Las Cruces	KRWG-FM
Maljamar	KMTH-FM
Portales	KENW-FM
Ramah	KTDB-FM
Santa Fe	KSFR-FM
Zuni	KSHI-FM

General Comments

The story of public radio coverage in New Mexico is similar to that in many other states: almost all well-populated areas are adequately covered, with the unserved regions tending to be remote and sparsely populated.

Three New Mexico public radio stations have yet to go on-air. All are in the north central or northwest part of the state. Over the course of the next year or so, the three should begin operations in Santa Fe, the Jicarilla Apache Reservation, and the northwest corner of the state in and around Farmington.

(In addition, Northern New Mexico Community College, Espanola, is well along the way towards receiving a construction permit. The College's signal should provide the first truly reliable signal to the residents of the Espanola Valley, which begins 25 miles north of Santa Fe.)

Two of these upcoming stations -- at the Jicarilla Apache Reservation and Espanola -- will be "Rocky Mountain Alternative Stations." In brief, such stations allow the operating entity to repeat the signal of another station and infuse some locally originated programming. Because they do not have to be monitored when acting as a translator, they represent a cost-effective way to reach small, usually remote communities with local programming inserts. (The characteristics of Rocky Mountain Alternative Stations are discussed more fully in the summary report of the public radio section.)

None of the stations listed above are "community" stations; they are all operated either by academic institutions or by Indian Tribal Governments. With the exception of KMTH-FM, which is a major satellite repeater of KENW, all are autonomous. New Mexico does not have a state system for public radio. The state, however, does have a public broadcasting commission that coordinates the coverage extension plans of the stations.

New Mexico has one public AM station, KABR, operated by the Alamo Navajo School Board. It broadcasts from the Alamo Indian Reservation, approximately 30 miles north of the community of Magdalena. KABR is a daytime-only station. The intent of the station is to broadcast programming designed for the Navajo people on the Reservation.

Some out-of-state signals contribute to New Mexico public radio coverage. To the north, KUTE-FM, in Ignacio, Colorado, is activating a translator in the Farmington area. Also in the north, KRZA-FM -- the city of license of which is Alamosa, Colorado -- broadcasts a signal that reaches a small part of New Mexico. In the south-central region, the signals of two El Paso FM stations, KTEP and KXCR, reach into New Mexico.

Uncovered Areas

Only three major unserved communities would appear to be without a reliable public radio signal: Gallup, Raton and Socorro. In part because of their size, they might be receptive to a "Rocky Mountain Alternative Station." All other unserved areas of the State are remote and sparsely populated. FM translators and, in some places, major satellite repeaters, would seem to be the best technologies to use in getting service to them.

We have identified nine unserved regions, in addition to the three major communities mentioned immediately above.

Region I

Region I consists of a number of elements. First, it includes that part of the Jicarilla Apache Reservation that will not be reached by the Tribe's station, KJAT-FM -- which, recall, has yet to go on-air. Second, it contains many small, isolated Hispanic villages. Finally, it encompasses two relatively major communities, Chama and Tierra Amarilla. The distance from major stations may inhibit coverage in this region, especially when the distance factor is combined with the rugged, mountainous terrain. In addition, we must consider the economic risk posed by attempting to serve an area with such a relatively small population.

The signals of the major public radio stations in Albuquerque, however, do reach some locations in this area with sufficient reliability to be repeated; this is how KJAT-FM, a Rocky Mountain Alternative Station, is being made possible. This means that the opportunity may exist for an entity to establish a series of translators to serve some of the larger, more accessible communities in this region.

Region II

Region II is the northeast corner of the State. The western part of this region is the area from Las Vegas to Taos/Eagle Nest. Rugged, mountainous terrain is commonplace here and the communities tend to be small and located in river bottoms. The eastern part of the region does have some mountains, but on the whole it is not quite so rugged. It is basically a high plains and grasslands region. However, even the plains areas -- south of Clayton and west of Tucumcari -- are very sparsely populated. The smaller communities to the west could probably be reach in a cost-effective way only by FM translators, while the eastern section of the region, because of its less difficult terrain, might support a major satellite repeater complemented by FM translators. Public radio experts in the region suggest that a major repeater might best be placed somewhere between Clayton and Springer.

KENW-FM's transmitter in Portales is presently situated in a valley. The station officials would like to move the transmitter/tower site to a more advantageous location on higher ground. This would extend the contours of KENW's signals and diminish somewhat the "white areas" around Portales.

Region III

Region III lies to the west and southwest of Portales. It has an extremely low population density. This would make it difficult to justify an extension project on economic grounds.

Region IV

Region IV is the far southeast corner of the State, encompassing Eunice and Jal, communities that would best be served by FM translators.

Region V

With Region V, which is ranching country, we again encounter an area of extremely low population density, one not likely to see public radio service in the near term.

Region VI

This region stretches north from Las Cruces to the served area to the south of Albuquerque. It includes the San Andreas Mountains and the White Sands Missile Range. Of its major communities, two are already served by FM translators repeating KRWG-FM's signal; these are Truth or Consequences (to the west) and Alamagordo (to the east). The region's other major community is Socorro, which was discussed above.

Region VII

Region VII is Hidalgo County, in the far southwest corner. If this sparsely populated area ever receives service, it will almost assuredly be via translators.

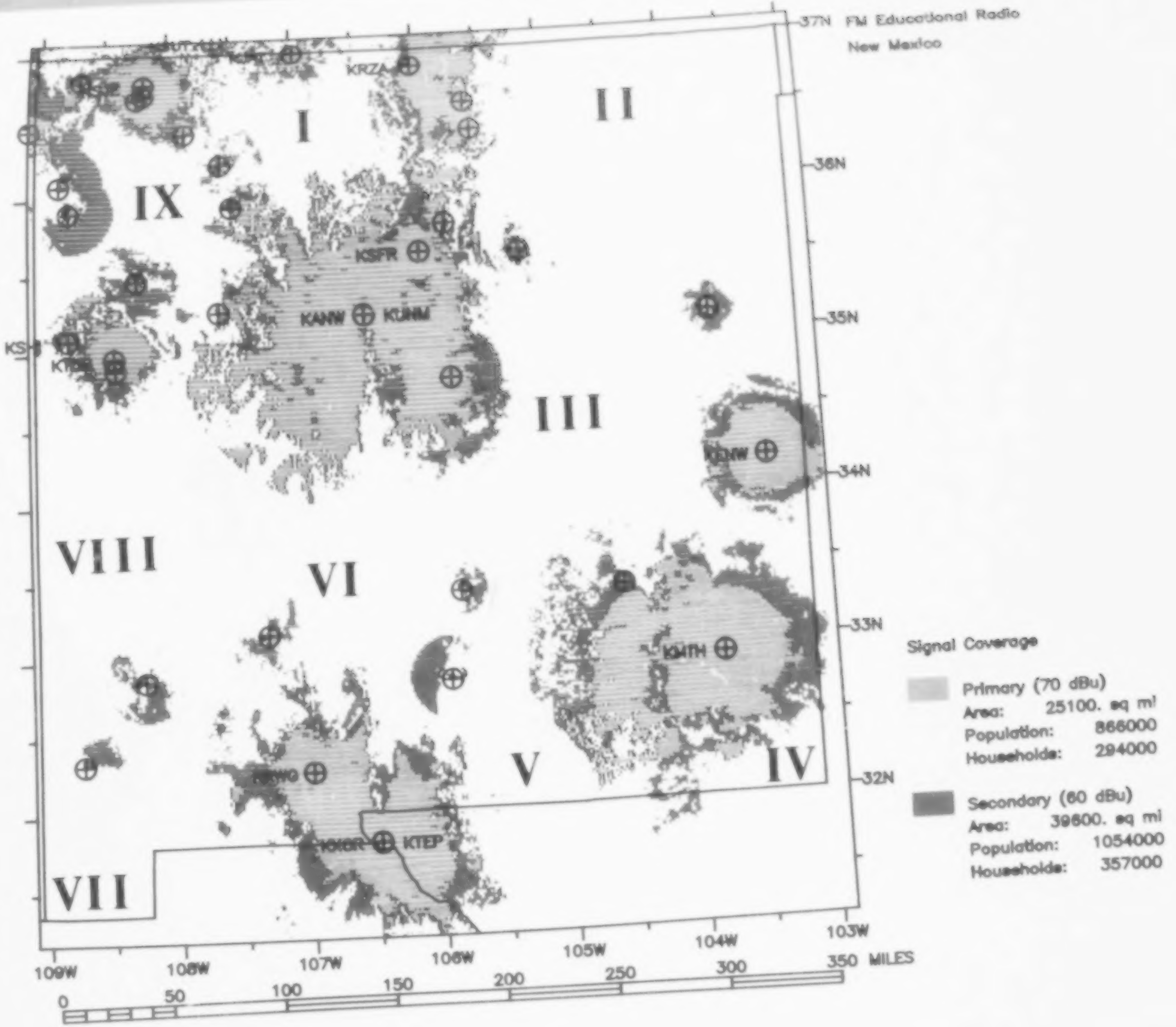
Region VIII

Translators would also be the best technology to use to extend public radio to our currently unserved Region VIII. This is the mountainous area running from Silver City -- served by a KRWG-FM translator -- through Cliff/Gila and Glenwood to Reserve. Knowledgeable observers have estimated that a series of 3-4 translators could cover this area. The section immediately to the east of these communities is extremely mountainous and may not be covered for some time.

Region IX

Region IX is the "white area" running to the southeast of Farmington. The population density of this region is extremely low. Actually, some part of it may well be covered by the signal of KSJE-FM when that station goes on-air, because the station's signal is directionalized to the south; this means that the signal may extend further in that direction than is depicted on the accompanying map. Other than this, it is not likely that any of this region will receive public radio except by the occasional FM translator.

FM Educational Radio
New Mexico



37N
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V
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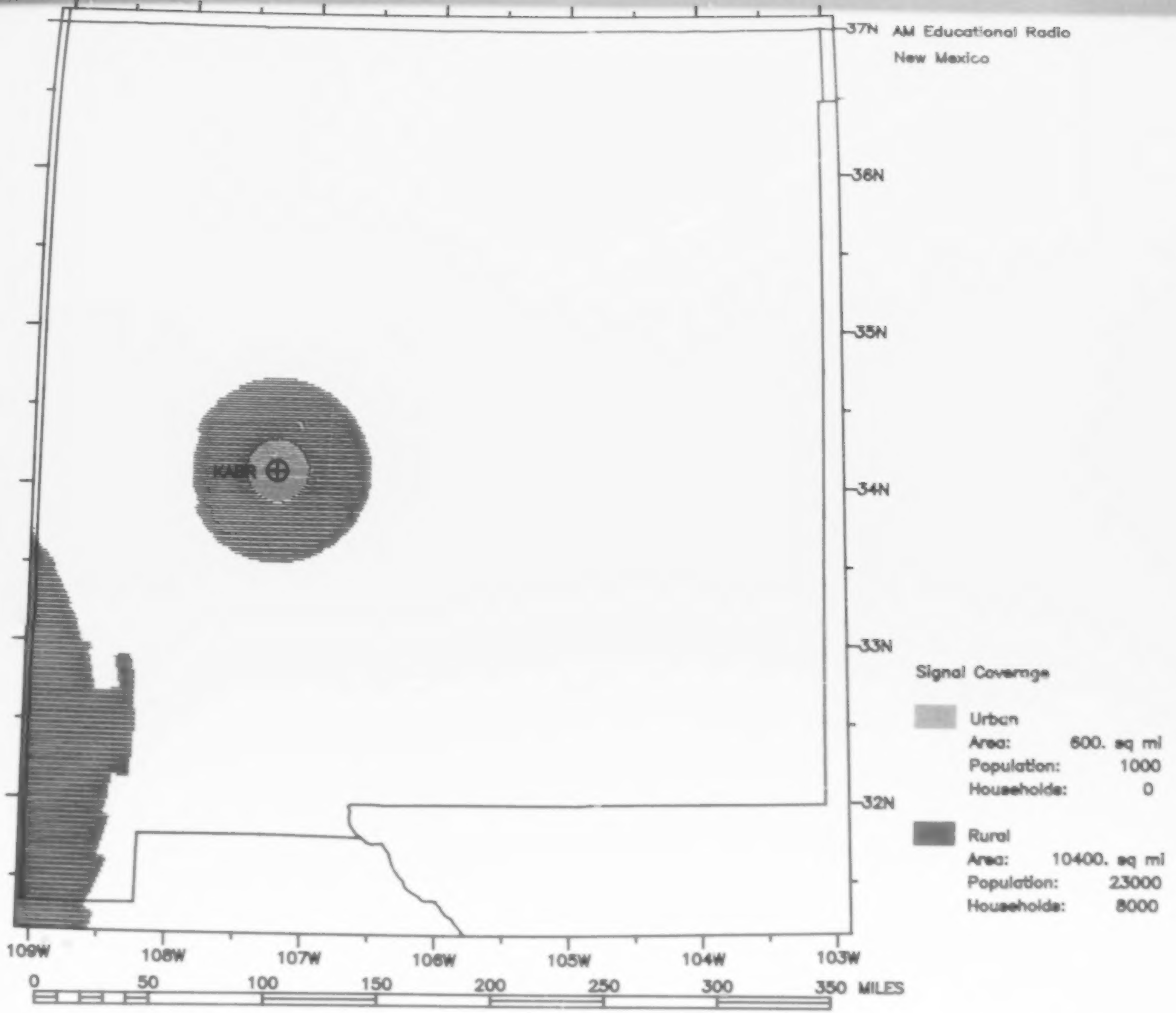
VII
VIII
IX
KRZA
KSFR
KANW
KUNM
KENW
KMTH
KRWG
KXCR
KTEP
KS
Signal Coverage
Primary (70 dBu)
Area: 25100. sq mi
Population: 866000
Households: 294000
Secondary (60 dBu)
Area: 39600. sq mi
Population: 1054000
Households: 357000

AM Educational Radio
New Mexico



37N
36N
35N
34N
33N
32N
109W
108W
107W
106W
105W
104W
103W
0
50
100
150
200
250
300
350 MILES
KABR
Signal Coverage
Urban
Area: 600. sq mi
Population: 1000
Households: 0
Rural
Area: 10400. sq mi
Population: 23000
Households: 8000

NEW YORK

Basic Statistics

Total State Population:	17,558,000
Total Population Receiving Public Radio Signal:	16,370,000 (93%)
Total Population in Uncovered Areas:	1,188,000

Public Radio Stations in State

Community	Call Letters
Albany	WAMC-FM
Binghamton	WHRW-FM WUCI-FM WSKG-FM
Buffalo	WBFO-FM WNED-FM WEBR-AM
Canajoharie	WCAN-FM
Canton	WSLU-FM
Fredonia	WCVF-FM
Ithaca	WPTC-FM
Jeffersonville	WJFF-FM
Kingston	WAMK-FM
New York	WBAI-FM WFUV-FM WNYC-FM WNYC-AM
Oneonta	WONY-FM
Oswego	WRVO-FM
Rochester	WXXI-FM WXXI-AM
Schenectady	WMHT-FM
Syracuse	WAER-FM WCNY-FM
Utica	WRVN-FM
Watertown	WJNY-FM

General Comments

The New York State Education Department (NYSED) is the state agency that provides financial support and administrative oversight to the entities that provide public radio coverage to New York. NYSED has been a major influence in the development of public broadcasting in the state.

New York has major mountain ranges -- the Catskills, the Adirondacks, and the Appalachians -- that are terrain barriers to broadcast signals and account for much of the "white space" in the state.

Uncovered Areas

NYSED has a state plan for the development of public radio and television and actively encourages completion of coverage. The majority of the state receives a public radio signal. However, according to a state spokesman, existing stations find that most of the "white spaces" lack a critical population mass to provide a reasonable base of financial resources. Without that base, it is difficult to justify the capital and operational expenses required to extend their signals to these unserved areas.

Long Island, the "southern tier," and the northeast are the most populated areas of the state without public radio. The remaining uncovered areas are located in mountainous areas and are primarily pockets where terrain or power limitations of existing equipment prevents signal penetration or dependable signal coverage. When the radio and television maps are compared, it is apparent that, because of the lower power of radio, there is considerably more unserved radio area than television in the three mountain ranges.

Region I

Region I, in the northeastern portion of the state, is, for the most part, sparsely populated. St. Lawrence University (WSLU-FM), has developed a translator system which provides service to some population pockets in the western Adirondaks. The terrain and the low power of the translators, however, do not permit complete coverage. An estimated 29 percent of the state's unserved population resides in this area.

In Region I, the area to the west of Plattsburgh is unserved. The Northeast New York Public Telecommunications Council has applied to the FCC for a radio frequency to serve Plattsburgh, most of which receives a signal from Vermont Public Radio across Lake Champlain. If activated, translators from that station could become a means of service to the west of Plattsburgh.

Region II

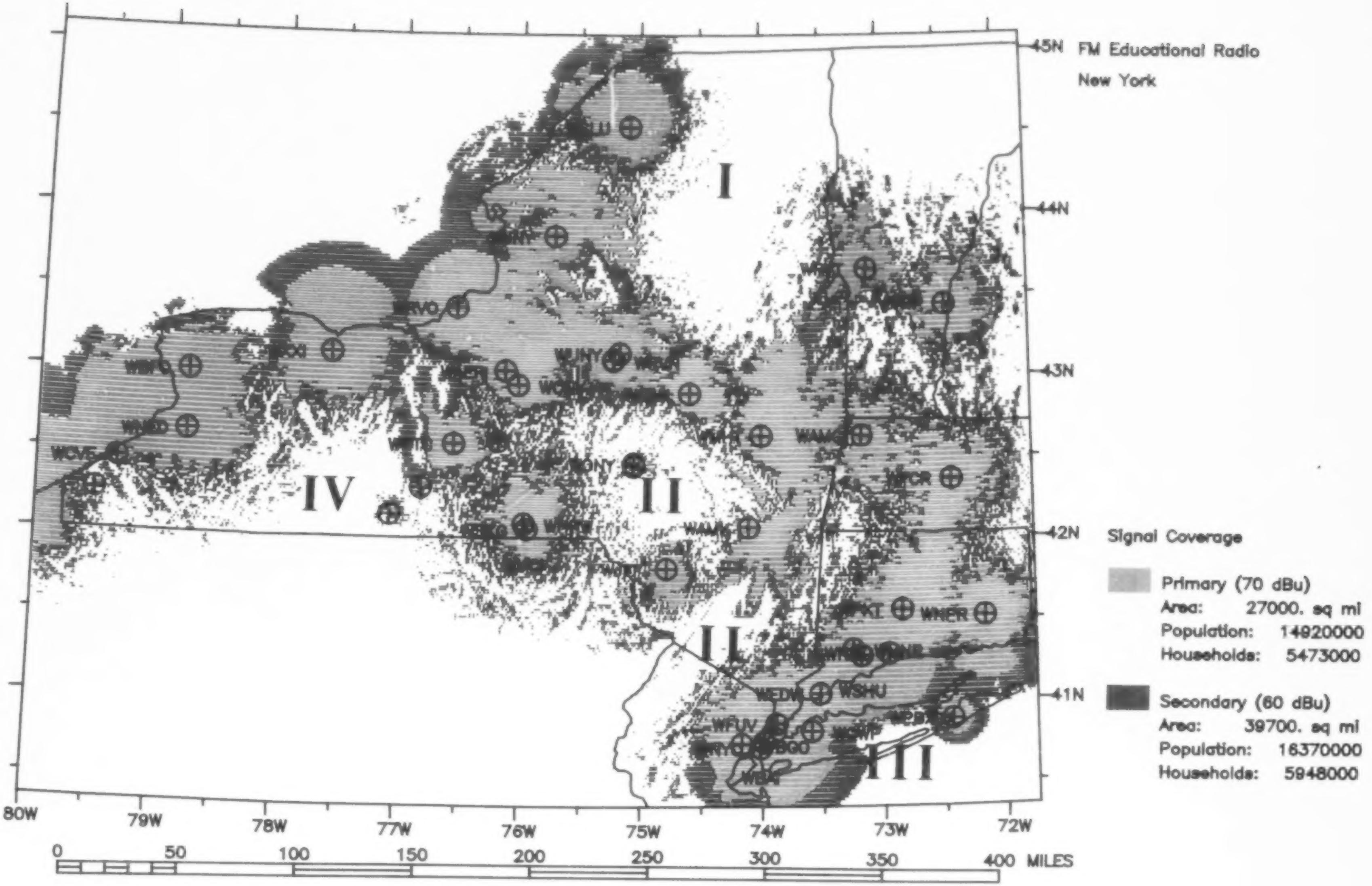
Region II, with about 27 percent of the state's unserved population, includes the Catskill Mountains. As in the other mountainous areas, coverage is spotty here. A recently licensed station, WJFF-FM, should provide service, however, to the Sullivan County area.

Region III

Region III, Long Island, has about 18 percent of the state's unserved population. The uncovered portions are due to this region's proximity to New York City and the lack of frequency availability. This has long been a concern to PTFP because of the large unserved population. In 1986 PTFP awarded a grant to Sacred Heart University in Bridgeport, Connecticut to increase power and to extend their signal across Long Island Sound. This service has brought public radio to many more Long Island residents. Unserved areas, however, continue to exist. The NYSED is currently working on plans to provide service to the remainder of Long Island and Sacred Heart University plans to increase its presence. The lack of frequencies, however, is a formidable obstacle.

Region IV

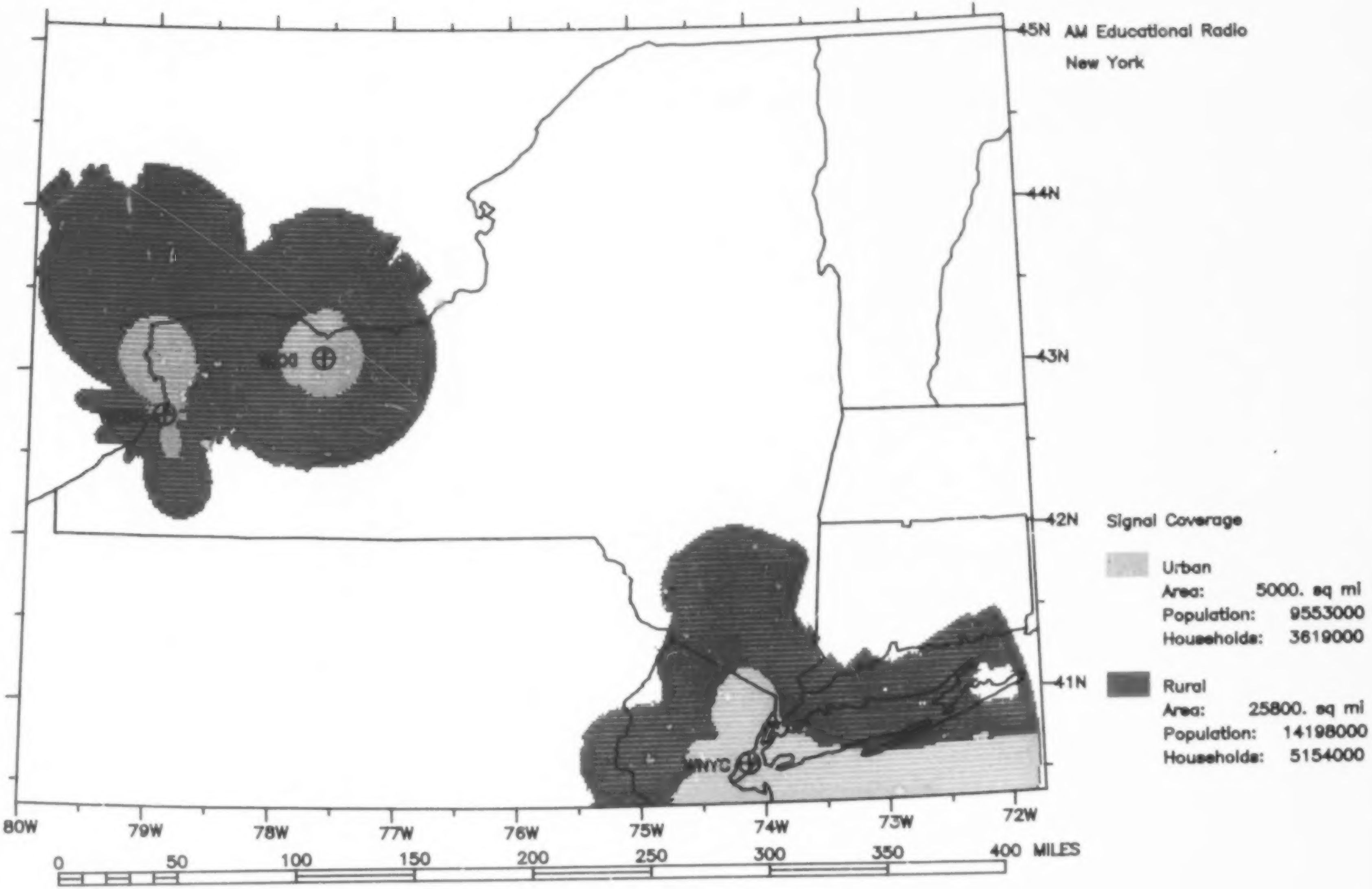
In Region IV, the Appalachians, it is noteworthy that there is a comprehensive system of television translators, which were funded 10-15 years ago by the Appalachian Regional Commission. That same region is without public radio. According to a state spokesman, this is because of the lack of economic resources available to the stations that would logically expand there. About 25 percent of the state's unserved population resides in this area.


FM Educational Radio

New York

45N
44N
43N
42N
41N
80W
79W
78W
77W
76W
75W
74W
73W
72W
0
50
100
150
200
250
300
350
400 MILES
I
II
III
IV
WBFO
WNED
WCVE
WRVO
WJNY
WAMC
WFCR
WNER
WSHU
WEDW
WFUV
WBGO
WBAI
WONY
Signal Coverage
Primary (70 dBu)
Area: 27000. sq mi
Population: 14920000
Households: 5473000
Secondary (60 dBu)
Area: 39700. sq mi
Population: 16370000
Households: 5948000

AM Educational Radio
New York


45N
44N
43N
42N
41N
80W
79W
78W
77W
76W
75W
74W
73W
72W
0
50
100
150
200
250
300
350
400 MILES
WNYC

Signal Coverage

▨ Urban
Area: 5000. sq mi
Population: 9553000
Households: 3619000

■ Rural
Area: 25800. sq mi
Population: 14198000
Households: 5154000

NORTH CAROLINA

Basic Statistics

Total State Population:	5,882,000	
Total Population Receiving Public Radio Signal:	5,019,000	(85%)
Total Population in Uncovered Areas:	863,000	

Public Radio Stations in State

Community	Call Letters
Asheville	WCQS-FM
Chapel Hill	WUNC-FM
Charlotte	WFAE-FM
Davidson	WDAV-FM
Fayetteville	WFSS-FM
Franklin	WFQS-FM
Greensboro	WNAA-FM
New Bern	WTEB-FM
Spindale	WNCW-FM
Warrenton	WVSP-FM
Wilmington	WHQR-FM
Winston-Salem	WFDD-FM

General Comments

The residents of North Carolina receive public radio signals from a variety of stations both from within and outside the state's borders. The majority of the public signals are from stations licensed to educational institutions although there are several community-based nonprofit educational organizations that operate public radio stations which qualify for inclusion in this study.

Uncovered Areas

There are basically three regions which do not receive reliable public radio signals. They are as follows:

Region I

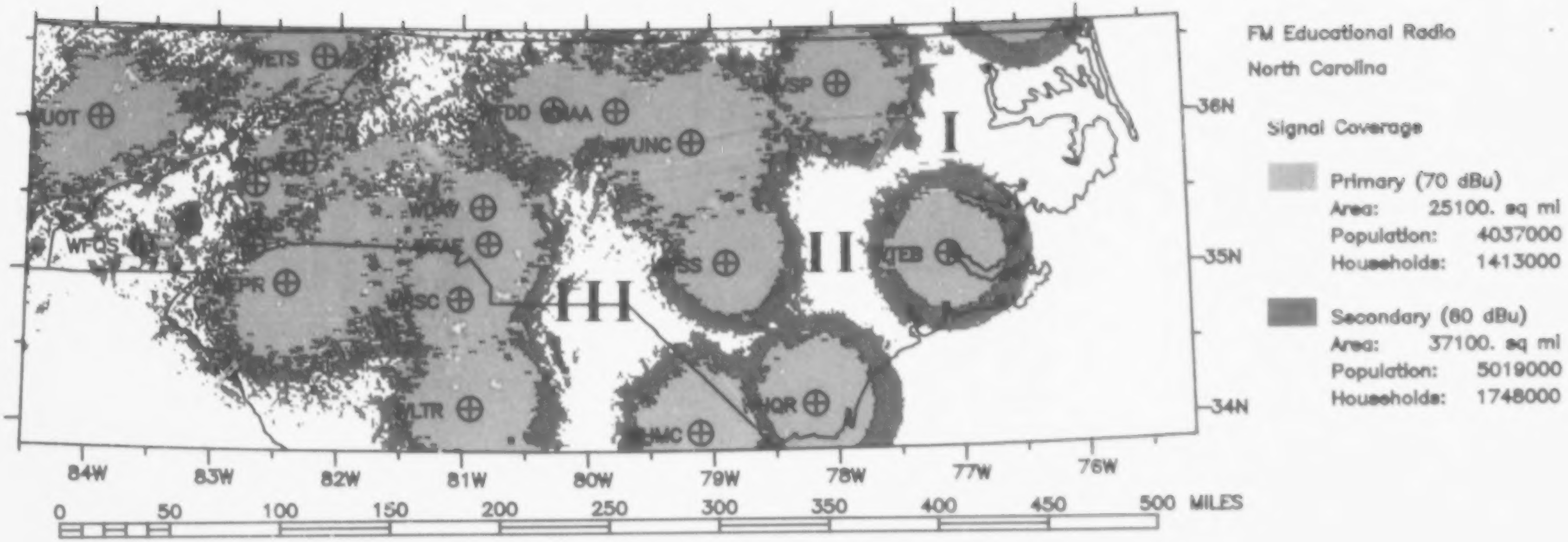
This is the northeastern part of the state. The construction of additional new public stations, repeater/satellite stations of existing stations and/or increases in the power of existing stations may be warranted in order to serve this area.

Region II

This uncovered region lies between Fayetteville (WFSS-FM), New Bern (WTEB-FM) and Wilmington (WHQR-FM). This crescent-shaped area could be served by either a series of radio translators or a repeater/satellite station to rebroadcast any of these three stations. One factor that could preclude this approach is the existence of a channel 6 television station assigned to Wilmington. Because of interference considerations, this proposed method of providing coverage may be prohibited or at least severely limited.

Region III

This uncovered area also extends well into South Carolina. The "white space" lies within the area that is influenced by channel 6 interference considerations. Officials from the South Carolina state radio network have expressed interest in providing service to this area but interference considerations must be addressed. These same considerations would obviously apply to any potential North Carolina licensee.


FM Educational Radio
North Carolina
Signal Coverage
Primary (70 dBu)
Area: 25100. sq mi
Population: 4037000
Households: 1413000
Secondary (60 dBu)
Area: 37100. sq mi
Population: 5019000
Households: 1748000
WUOT
WETS
WFDD
WUNC
SP
TEB
SS
WDAV
WFAE
WFQS
EPR
WSSC
LTR
HQR
UMC
I
II
III
36N
35N
34N
84W
83W
82W
81W
80W
79W
78W
77W
76W
0
50
100
150
200
250
300
350
400
450
500 MILES

NORTH DAKOTA

Basic Statistics

Total State Population:	653,000
Total Population Receiving Public Radio Signal:	452,000 (69%)
Total Population in Uncovered Areas:	201,000

Public Radio Stations in State

Community	Call Letters
Belcourt	KEYA-FM
Bismarck	KCND-FM
Dickinson	KDPR-FM
Fargo	KDSU-FM
Four Bears	KMHA-FM
Grand Forks	KFJM-AM
	KFJM-FM
Minot	KMPR-FM
Williston	KPPR-FM

General Comments

Virtually all the heavily settled locations in North Dakota are served by a public radio signal. One exception is the community of Jamestown in the east central region; this will be discussed below.

By and large, this coverage is achieved by the nine major stations noted above, with some FM translators. However, two out-of-state signals do contribute. KCCM-FM, part of the Minnesota Public Radio chain, reaches into southeastern North Dakota from its transmission site in Moorhead, Minnesota. KDSD-FM, located in Pierpont, South Dakota, covers the extreme southeast of North Dakota. KDSD is a major satellite repeater of the South Dakota state public radio system.

Of the stations listed above, four are operated by Prairie Public Broadcasting, Inc. (PPB). The PPB radio flagship station is KCND-FM in Bismarck. The other three stations -- in Minot, Williston, and Dickenson -- are major satellite repeaters.

Two autonomous stations -- KEYA-FM and KMHA-FM -- serve Indian Reservations, the former the Turtle Mountain Reservation, the latter the Ft. Berthold Reservation.

AM service consists of station KFJM-AM, operated by the University of North Dakota. KFJM-AM offers a 24-hours-a-day, seven-days-a-week service. Its format, which is distinctive from that of its sister FM station, places a strong emphasis on news and informational programming. Its power, however, decreases sharply during the night hours to one-fourth its daytime power. At night, its "Rural" contour has only about a 30-mile radius, less than half its daytime reach. This means, for example, that to the north it does not quite extend to the community of Grafton.

Uncovered Areas

Regions I and IV

Regions I and IV may be considered together, because their situations are so similar. Although these areas are unserved, it appears that an acceptable signal, less than the 60 dBu, is received throughout much of this region. This would mean that the remaining areas without signals are remote and very sparsely populated. One such spot would be the far southwest corner. This is Bowman County, which is the site of the famous "Badlands." Extension of service here may be financially impractical.

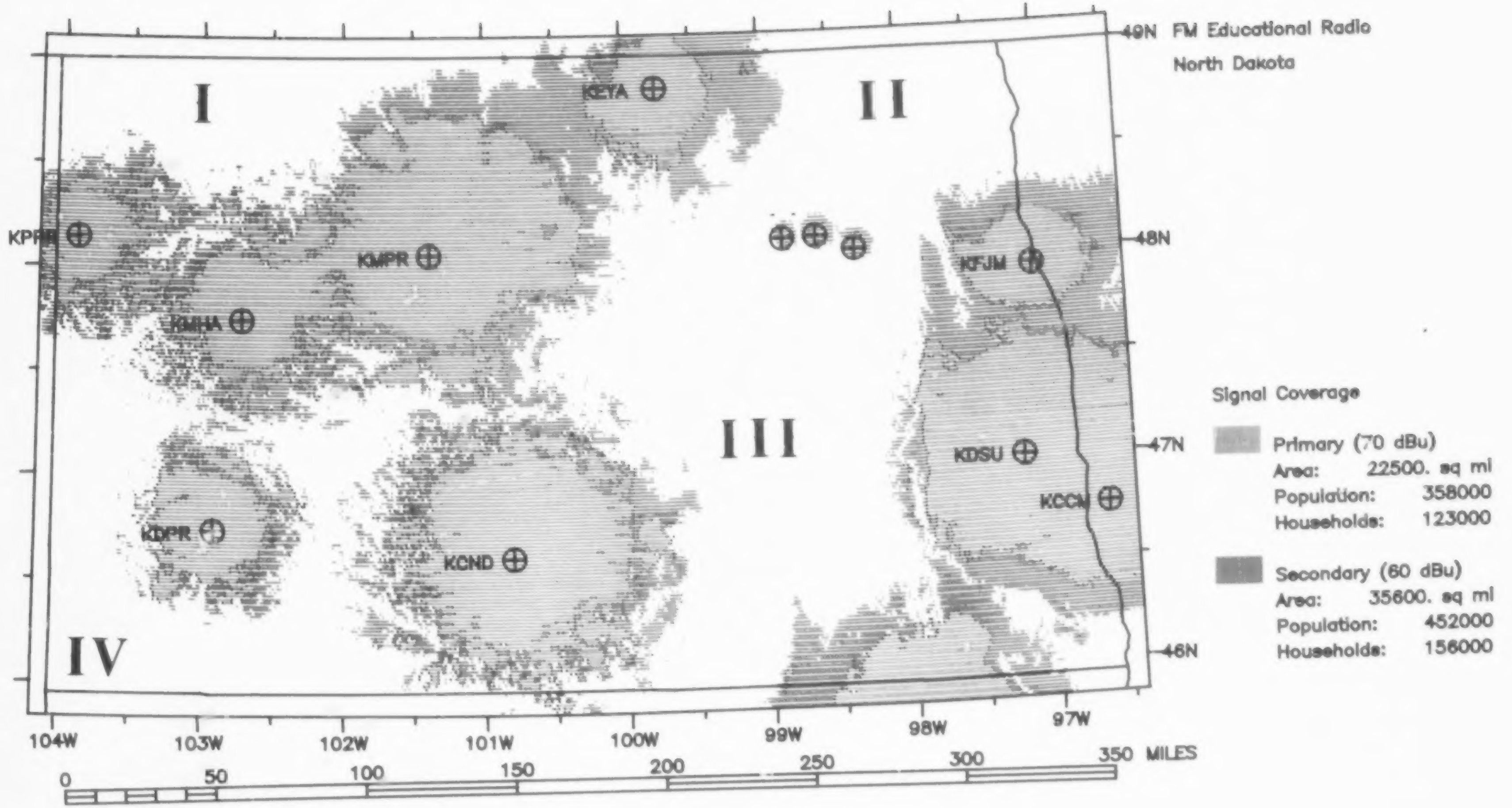
The northwest corner (Region I) may remain unserved because of the difficulty in justifying extension of service on economic grounds. A PPB official did suggest, however, that if coverage were to be achieved, a string of two or three FM translators might do the job.

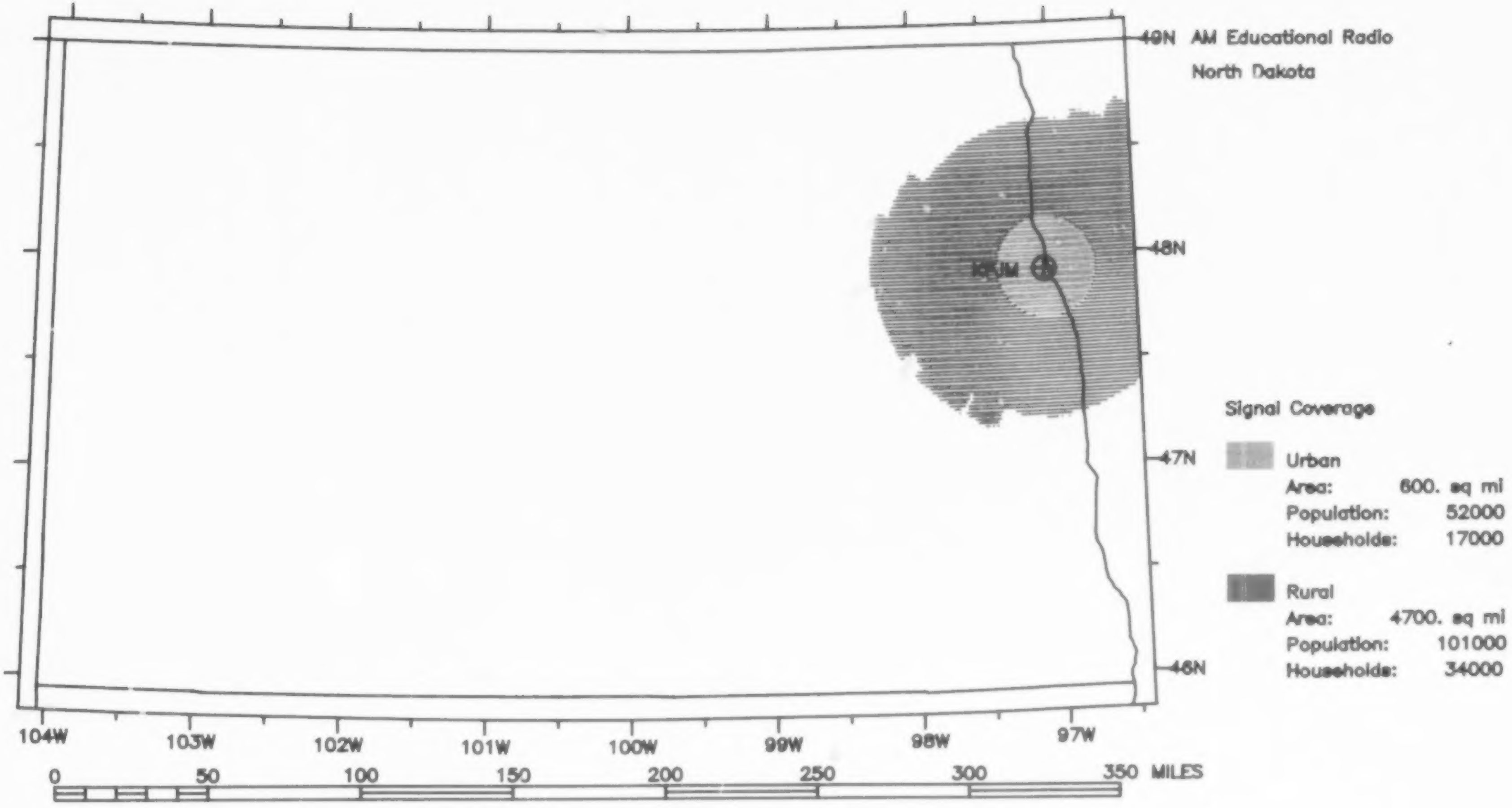
Region II

Region II is the northeast corner of the state, and is the logical zone of responsibility of KFJM, operated by the University of North Dakota, Grand Forks. Region II has a very low population density. This implies that any construction of a major satellite repeater would bring with it some economic risk. The terrain would appear to favor such construction, however, since the areas are either flat or characterized by low hills. Probably the best solution would be a major satellite repeater, complemented by translators.

Region III

Region III, the central and south central portion of the state, would be best served by a major satellite repeater. The key community is Jamestown, which may in the near future be the site of a major PPB television repeater. If this were to occur, the next step would be for PPB to activate a full-power FM radio repeater station. The signal from such a station would reach by far the greater part of this unserved region.


FM Educational Radio
North Dakota
Signal Coverage
Primary (70 dBu)
Area: 22500. sq mi
Population: 358000
Households: 123000
Secondary (60 dBu)
Area: 35600. sq mi
Population: 452000
Households: 156000
I
II
III
IV
KPPR
KMPR
KMHA
KEYA
KFJM
KDSU
KCCM
KDPR
KCND
49N
48N
47N
46N
104W
103W
102W
101W
100W
99W
98W
97W
0
50
100
150
200
250
300
350 MILES


49N
48N
47N
46N
104W
103W
102W
101W
100W
99W
98W
97W
KFJM
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Urban
Area: 600. sq mi
Population: 52000
Households: 17000
Rural
Area: 4700. sq mi
Population: 101000
Households: 34000

AM Educational Radio
North Dakota

OHIO

Basic Statistics

Total State Population:	10,798,000
Total Population Receiving Public Radio Signal:	9,528,000 (88%)
Total Population in Uncovered Areas:	1,270,000

Public Radio Stations in State

Community	Call Letters
Athens	WOUB-FM WOUB-AM
Cambridge	WOUC-FM
Chillicothe	WVXC-FM
Cincinnati	WVXU-FM WGUC-FM WAIF-FM
Cleveland	WCPN-FM
Columbus	WCBE-FM WOSU-FM WOSU-AM
Ironton	WOUL-FM
Kent	WKSU-FM
Lima	WGLE-FM
Oxford	WMUB-FM
Toledo	WGTE-FM
Wilberforce	WCSU-FM
Yellow Springs	WYSO-FM
Youngstown	WYSU-FM

General Comments

The Ohio Educational Television Network (OETN) is the state coordinating body mandated by the Ohio General Assembly to coordinate public broadcasting and to provide state coverage. The majority of Ohio residents receive a public broadcasting signal.

Complementing the service of Ohio's numerous FM public radio stations are two AM public stations: WOSU-AM, licensed to Ohio State University, Columbus, and WOUB-AM, licensed to Ohio University, Athens. WOSU-AM's daytime signal strength is 5 kw and its Rural-grade contour, as the accompanying map shows, is quite far-ranging. At night, however, the station's signal strength drops to 1 kw. WOSU-AM's daytime Urban-grade signal would appear to reach very few people not receiving a reliable FM public radio signal. Its Rural-grade signal, at least in the daytime, would seem to be reaching a substantial number of "unserved" persons, especially to the north and northeast of Columbus. At night, however, when WOSU-AM's contours shrink quite a bit, it is uncertain how far its signal projects in a reliable way. Station WOUB-AM, in Athens, has a daytime signal strength of 500 w; this increases to 1 kw at night. Its contours appear to be entirely within those of FM public radio stations.

Uncovered Areas

Regions I, II and VI

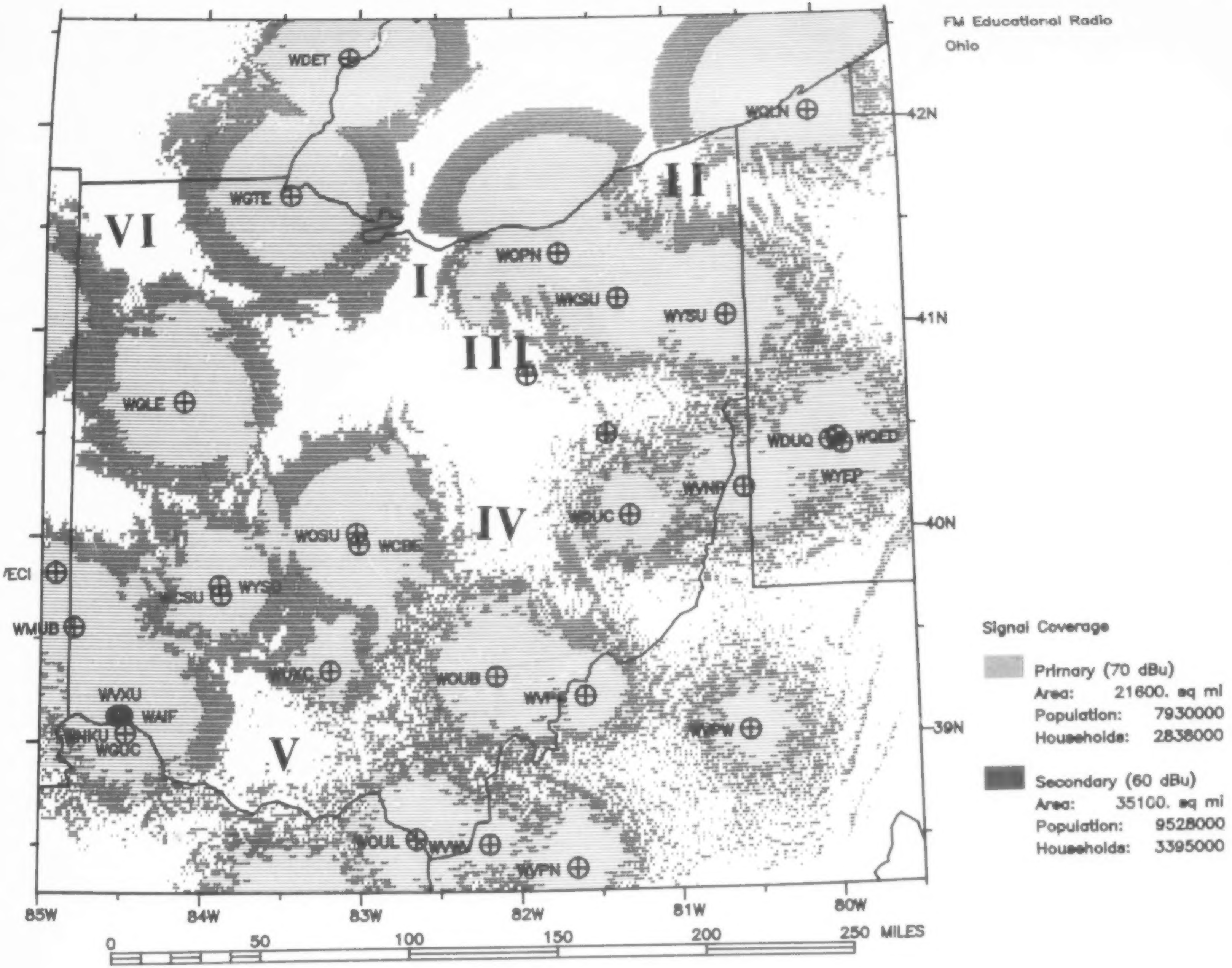
According to the OETN, Regions I, II and VI are unserved because of the unavailability of frequencies. There are 73 non-commercial low wattage or student-operated educational stations in the state. OETN sees their upgrade as a possible means of providing service in these regions. They are also considering purchase of commercial AM stations. Perhaps 30 percent of the state's unserved population resides in these three regions.

Regions III and IV

Although a channel 6 television station located in Columbus will influence the development of public radio in Regions III and IV, Ohio State has filed applications at the FCC for construction permits to serve Mansfield (Region III) and Zanesville (Region IV). We estimate that approximately half of Ohio's unserved residents live in these two regions.

Region V

In Region V, a new facility is being planned that will be located in West Union, south of WVXC-FM. This new facility should fill a portion of the "white space" in this region. (WVXC-FM, in Chillicothe, is plotted on the accompanying map, but due to a misprint, appears as WUXC-FM.)



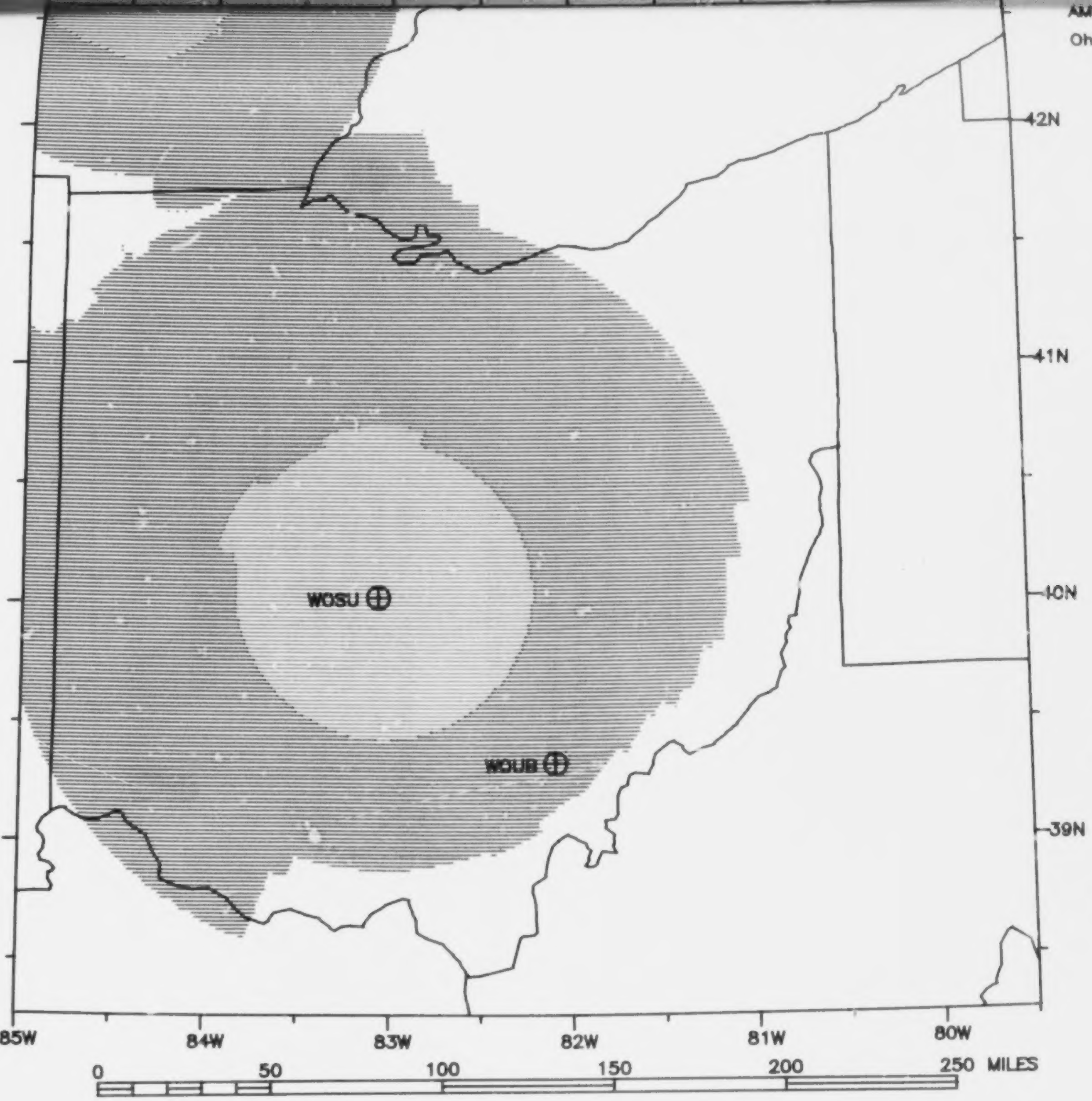
FM Educational Radio

Ohio

WDET
WGTE
WQLN
WOPN
WKSU
WYSU
WQLE
WDUQ
WQED
WYEP
WVNP
WOUC
WOSU
WCBE
/ECI
WCSU
WYSO
WMUB
WUXC
WOUB
WVPB
WVPW
WVXU
WAIF
WNKU
WGUC
WOUL
WVWV
WVPN
VI
I
II
III
IV
V
42N
41N
40N
39N
85W
84W
83W
82W
81W
80W
0
50
100
150
200
250 MILES
Signal Coverage
Primary (70 dBu)
Area: 21600. sq mi
Population: 7930000
Households: 2838000
Secondary (60 dBu)
Area: 35100. sq mi
Population: 9528000
Households: 3395000

AM Educational Radio

Ohio


42N
41N
40N
39N
WOSU
WOUB
85W
84W
83W
82W
81W
80W
0
50
100
150
200
250 MILES

Signal Coverage

▨ Urban
Area: 6300. sq mi
Population: 1574000
Households: 563000

▨ Rural
Area: 33000. sq mi
Population: 7430000
Households: 2621000

best copy available

OKLAHOMA

Basic Statistics

Total State Population:	3,025,000
Total Population Receiving Public Radio Signal:	2,121,000 (70%)
Total Population in Uncovered Areas:	904,000

Public Radio Stations in State

Community	Call Letters
Edmond	KCSC-FM
Lawton	KCCU-FM
Norman	KGOU-FM
Stillwater	KOSU-FM
Tulsa	KWGS-FM

General Comments

Although vast stretches of Oklahoma remain unserved by public radio, all the heavily populated areas currently receive at least one signal. Oklahoma City receives two signals and, when KGOU places its repeater in the city, will receive three.

The public radio stations noted above are autonomous. No state coordinating group exists.

The coverage offered by the Oklahoma stations is complemented by signals originating from out-of-state. Station KANU-FM, operated by the University of Kansas, Lawrence, hopes to activate an FM translator in Bartlesville. Station KANZ-FM, operated by The Kanza Society, Garden City, KS, has an FM translator in the Panhandle city of Guymon. And the contours of the newly activated KRPS-FM, Pittsburg, KS, push into far northeast Oklahoma. KRPS is operated by Pittsburg State University.

UNCOVERED AREAS

Before we discuss specific unserved regions, a few general remarks may be made.

First, without exception, the unserved areas of Oklahoma are rural and very sparsely populated. Some localities are outright remote. Others are relatively poor. A few are both.

Second, the point made immediately above would suggest that it is unlikely that any more full-service, "stand-alone" stations would be supportable. Yet, we do not rule out the possibility of such a station if, by some engineering configuration, it were able to cover the entire southeast corner of the state.

Most likely, however, any further public radio coverage will be achieved by the extension of the signals of presently existing stations, either by FM translators or by major repeater stations.

Third, the presence of two channel 6 television stations -- one in Wichita Falls, TX and the other in Tulsa -- may inhibit the activation of major public radio stations in certain parts of Oklahoma. Although we have not been able to study this factor in any detail, it would appear to be a problem in the southeast and southwest corners of the state. This situation would argue for consideration of FM translators to serve these areas.

Fourth, Oklahoma has in place an extensive system of public television originating stations, major repeater stations, and translators. The towers associated with this system are located throughout the state. Conceivably, they might be used to assist in the extension of public radio signals, although no plans for such usage are active at this writing. If this network of towers were to be fully utilized, then presumably the entire state could one day be served by Oklahoma-based public radio.

With these general points made, we may turn to a discussion of the unserved regions. We have identified two.

Region I

Region I, the western part of the state, including the Panhandle, consists of very sparsely populated communities. To illustrate, Harper County has under 5,000 residents; Ellis and Dewey Counties have under 6,000 each; Beaver County has slightly over 6,800. The flatness of the terrain might allow for the effective use of major satellite repeater stations, if the channel 6 problem could be overcome and the projects could be sufficiently justified on economic grounds. Otherwise, a series of FM translators would have to do.

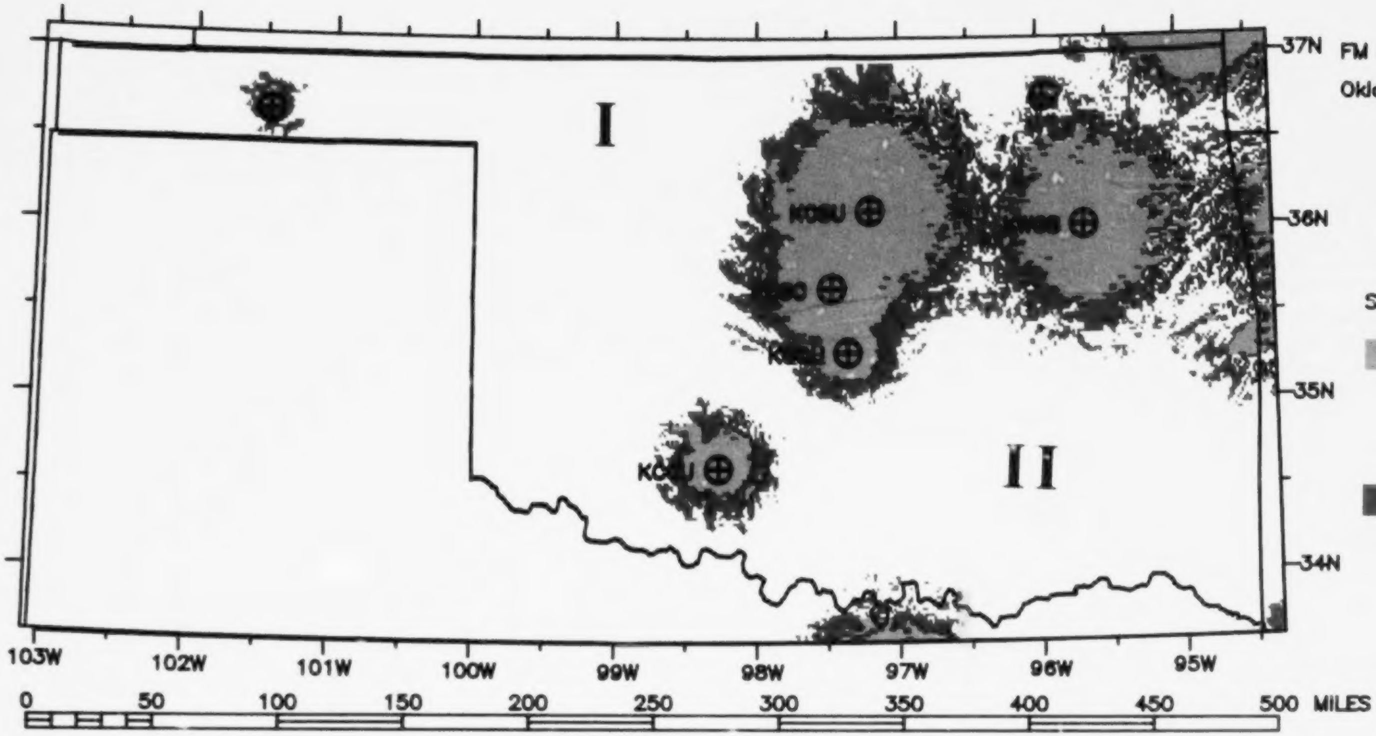
Region II

Region II, the southeastern portion of Oklahoma, is dominated by a series of mountain ranges. Ringing the mountains are rather small communities. Given the rugged nature of much of the terrain, the presence of a channel 6 situation, and the predictable difficulty one would encounter in attempting to rally economic support for a major station, FM translators would appear to be the best way to reach much of this region.

A final point: the accompanying map indicates that the northeast corner of the state, near the Kansas state line, may not be fully served. Oklahoma public radio officials dispute this, however, contending that the signal of KWGS-FM, Tulsa, does indeed reach the Kansas line with reliable strength. This would diminish the "white space" on the map to the point where it was inconsequential.

FM Educational Radio

Oklahoma


I
II
KOSU
103W
102W
101W
100W
99W
98W
97W
96W
95W
37N
36N
35N
34N
0
50
100
150
200
250
300
350
400
450
500 MILES

Signal Coverage

▨ Primary (70 dBu)

Area:	12400. sq mi
Population:	1779000
Households:	652000

■ Secondary (60 dBu)

Area:	20100. sq mi
Population:	2121000
Households:	777000

OREGON

Basic Statistics

Total State Population:	2,633,000
Total Population Receiving Public Radio Signal:	2,337,000 (89%)
Total Population in Uncovered Areas:	296,000

Public Radio Stations in State

Community	Call Letters
Ashland	KSOR-FM
	KSMF-FM
Astoria	KMUN-FM
Bend	KOAB-FM
	KWBX-FM
Coos Bay	KSBA-FM
Corvallis	KOAC-AM
Eugene	KLCC-FM
	KWAX-FM
Klamath Falls	KSKF-FM
Pendleton	KRBM-FM
Portland	KBOO-FM
	KBPS-AM
	KBPS-FM
	KOAP-FM
Warm Springs	KWSO-FM

General Comments

The Cascade Mountain range, running from the Washington border to the California border, divides the state of Oregon into two parts. The western portion, with a majority of the state's population, is served by ten public radio stations. Four stations are located in Portland. KOAP is the main radio station operated by Oregon Public Broadcasting. The Multnomah Schools operate two stations, KBPS-AM and KBPS-FM, which provide separate program services. KBOO is a community radio station which provides an eclectic program format.

KMUN is located in Astoria at the mouth of the Columbia River. It has translators, not shown on the map, to extend service to the Vernonia-Jewell-Mist area of the Columbia River valley, and to Cannon Beach and Wheeler along the Oregon coast.

Service in central west Oregon is provided by stations in Corvallis and Eugene. KOAC-AM in Corvallis is a station which repeats approximately 90 percent of KOAP-FM, Portland. KLCC and KWAX are two independent stations located in Eugene.

Southwest Oregon is covered by KSOR, Ashland, which has an extensive series of repeater stations and translators throughout the area and into northern California. KSOR operates repeater stations KSBA in Coos Bay and KSKF in Klamath Falls, with an additional repeater station under construction in Roseburg. KSOR also operates a second station in Ashland, KSMF.

Radio signals from these stations to communities on the Pacific coast are blocked by the Coast mountains. KSOR, KMUN and Oregon Public Broadcasting all currently provide translator service or repeater stations to serve coastal communities.

Public radio in Oregon east of the Cascade Mountains is primarily provided by Oregon Public Broadcasting (OPB), the operating unit of the Oregon Commission on Public Broadcasting.

OPB operates main production and transmission facilities in Portland, with repeater stations east of the Cascades in Bend and Pendleton. OPB also operates a statewide microwave system which extends public radio service throughout the state. This microwave system feeds translators located along the Oregon coast, Columbia River valley, and in eastern Oregon.

KWAX, Eugene, also operates a repeater station, KWBX, in Bend, while KLCC has a translator located to serve that community. North of Bend, the Confederated Tribes of Warm Springs operates station KWSO-FM.

The above coverage figures do not include the population served by KOAC-AM, Corvallis, which reaches some communities not covered by any public FM station.

Uncovered Areas

Region I

Northeast Oregon consists primarily of national forest, Eagle Cap Wilderness Area and the Hell's Canyon National Recreational Area. This area has few population centers.

OPB has plans to provide translator service to Halfway, Richlands and Durkee in Baker County. These plans have been delayed due to licensing problems because of potential interference with television channel 6.

Region II

The area between John Day and Baker consists primarily of the Umatilla National Forest. OPB has plans to provide translator service to Heppner, to the northwest of John Day.

Region III

Harney and Malheur Counties in southeast Oregon are vast areas with extremely low population. OPB hopes to provide service to Baker and Ontario if channel 6 interference problems can be resolved.

Region IV

The area south of Bend consists primarily of national forest, with the Cascade Mountains to the west. KOAB is received by communities in the Christmas Valley.

Region V

KOAB, Bend, is received north to the Columbia River Gorge. The Confederated Tribes of Warm Springs operates KWSO, Warm Springs, which also serves this area.

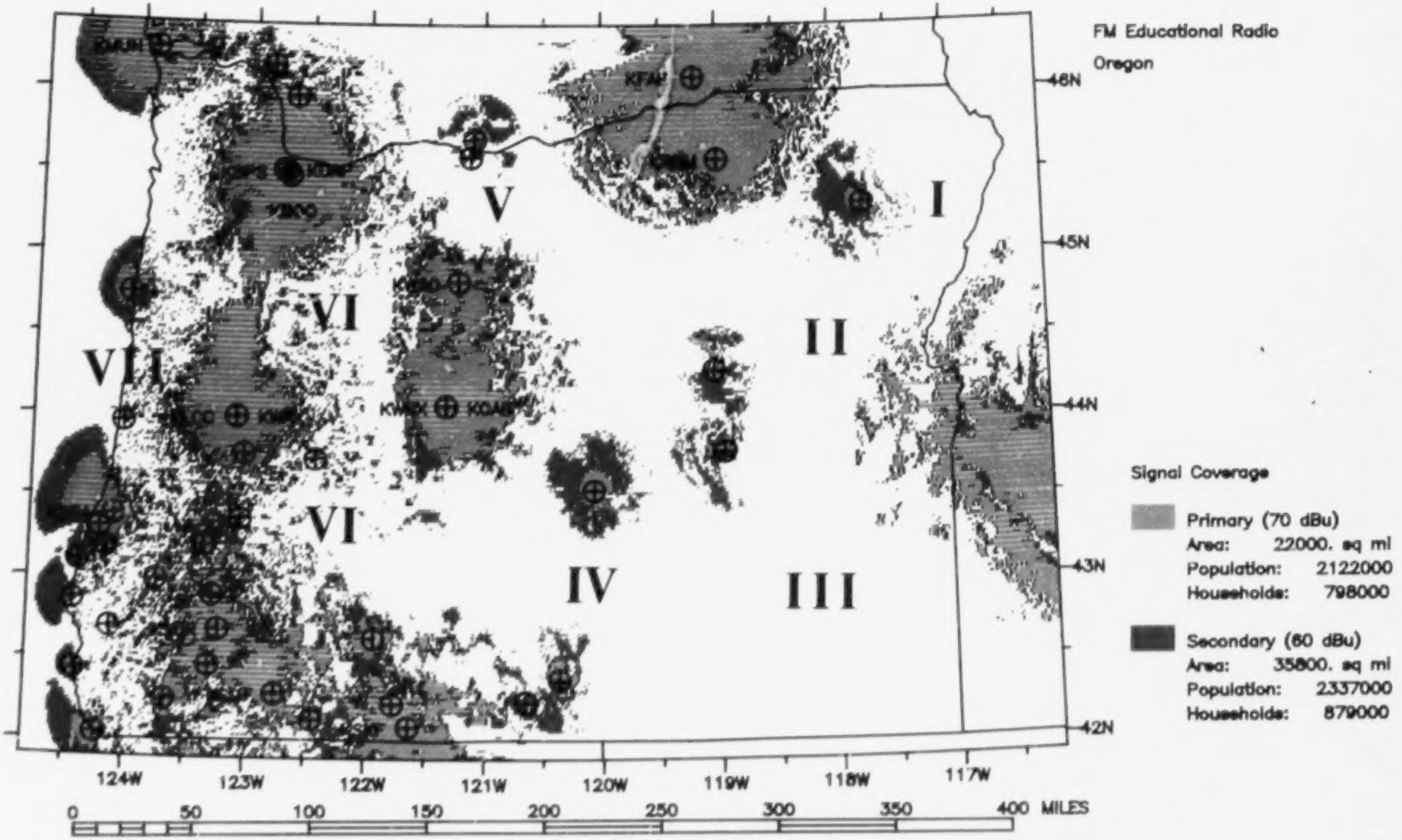
Region VI

This area is the high ridge of the Cascade Mountains and is composed of a series of national forests from the Columbia River to the California border.

Region VII

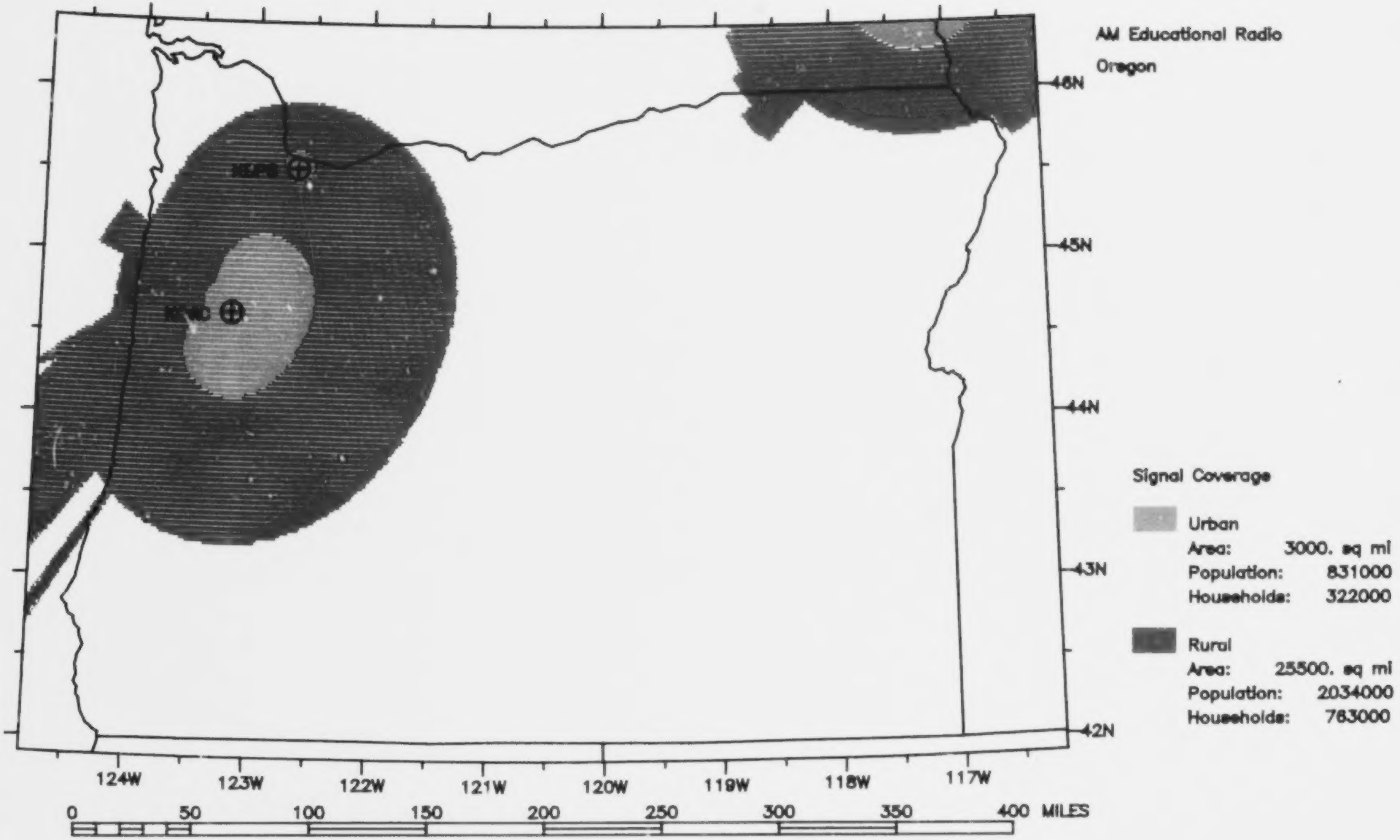
Communities along the Oregon Coast are cut off from public radio service by the Coast Range of mountains. The current service providers plan to extend service to this area. KLCC and KWAX in Eugene plan to extend service to the Oregon Coast, KLCC to Newport and KWAX to Newport and Coos Bay. KMUN in Astoria plans to extend service to Tillamook, Bay City and Garibaldi. OPB would like to extend service to Rockaway Beach.

Regions VI and VII include about 34 percent and 27 percent, respectively, of Oregon's unserved population.


FM Educational Radio
Oregon
Signal Coverage
Primary (70 dBu)
Area: 22000. sq mi
Population: 2122000
Households: 798000
Secondary (60 dBu)
Area: 35800. sq mi
Population: 2337000
Households: 879000
46N
45N
44N
43N
42N
124W
123W
122W
121W
120W
119W
118W
117W
0
50
100
150
200
250
300
350
400 MILES
I
II
III
IV
V
VI
VI
VII
KMUN
KFAE
KWAX
KOAB

AM Educational Radio

Oregon



KBPS
KOAC
46N
45N
44N
43N
42N
124W
123W
122W
121W
120W
119W
118W
117W
0
50
100
150
200
250
300
350
400 MILES
Signal Coverage
Urban
Area: 3000. sq mi
Population: 831000
Households: 322000
Rural
Area: 25500. sq mi
Population: 2034000
Households: 783000

PENNSYLVANIA

Basic Statistics

Total State Population: 11,864,000

Total Population Receiving Public Radio Signal: 9,093,000 (77%)

Total Population in Uncovered Areas: 2,771,000

Public Radio Stations in State

Community	Call Letters
Erie	WQLN-FM
Harrisburg	WITF-FM
Lancaster	WLCH-FM
Philadelphia	WHYY-FM
	WRTI-FM
	WXPN-FM
Pittsburgh	WDUQ-FM
	WYEP-FM
	WQED-FM
Scranton	WVIA-FM
State College	WPSU-FM

General Comments

Public radio stations in Pennsylvania are licensed to a mixture of community organizations and educational institutions. Pennsylvania Public Television Network (PPTN) is the state agency which supports existing public radio and television stations and is responsible for developing a state plan for public broadcasting service. In 1982, NTIA provided funds to PPTN for a comprehensive study of all uncovered areas.

Mountainous topography throughout the state is the major impediment to the propagation of broadcast signals. Although transmitters are purposely placed on high peaks, the population centers in the "white areas" tend to be in the valleys which are shadowed by the steep mountains. In some areas, translators have been used successfully to extend service.

Uncovered Areas

Although a substantial portion of the population of Pennsylvania receives a 60 dBu public radio signal, a significant number of residents do not.

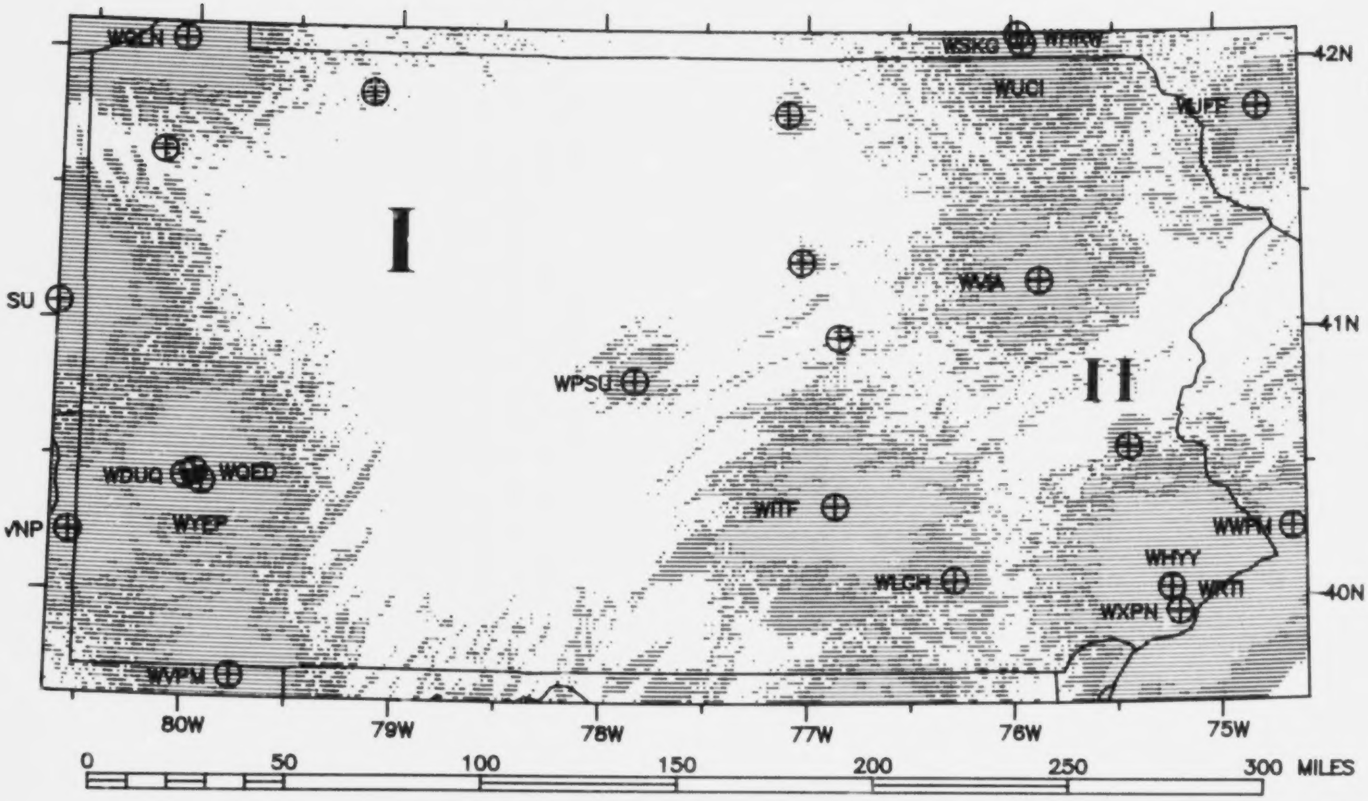
Region I

Region I, the central part of the state, includes the majority of the "white space" and 2.1 million of the unserved population. This region includes the urban areas of Altoona and Johnstown as well as a number of smaller communities and a large rural population. Both Altoona and Johnstown are served by TV channel 6 which substantially reduces the possibility of establishing any new FM service. WPSU is in the central portion of this area. Although the station met the minimum requirements for inclusion in this study, Pennsylvania State University is in the process of upgrading the facility and is seeking a power increase, which, if implemented, should cover some of the surrounding "white area." The addition of translators once the upgrading is accomplished, will further expand coverage in this region.

Coverage solutions are difficult because of the size of the area to be covered as well as the ruggedness of terrain. Translators could possibly be employed to bring limited service to scattered communities. PPTN, however, suggests the use of one or two high-power AM stations. FM signals are line of sight, and therefore mountains prevent adequate signal propagation. PPTN feels that AM propagation characteristics are more practical and could be used to serve the area.

Region II

Region II was studied by Lehigh Valley Public Telecommunications Corporation, the licensee of WLVT-TV which serves the area. The study revealed a channel 6 problem which will prevent the establishment of a radio station in the reserved FM band. A recently installed translator in Allentown, currently provides service to the area. There are, however, no known plans for a full-service station.


WQLN
WSKG
WHRW
WUCI
WJFF
I
SU
WVIA
II
WPSU
WDUQ
WQED
WYEP
vNP
WITF
WWFM
WHYY
WRTI
WLCH
WXPN
WVPM
42N
41N
40N
80W
79W
78W
77W
76W
75W
0
50
100
150
200
250
300 MILES

FM Educational Radio

Pennsylvania

Signal Coverage

▨ Primary (70 dBu)

Area:	13100. sq mi
Population:	7599000
Households:	2712000

■ Secondary (60 dBu)

Area:	20300. sq mi
Population:	9093000
Households:	3239000

RHODE ISLAND

Basic Statistics

Total State Population:	947,000
Total Population Receiving Public Radio Signal:	760,000 (80%)
Total Population in Uncovered Areas:	187,000

Public Radio Stations in State

Community	Call Letters
NONE	

General Comments

Rhode Island has no public radio stations as defined in this study. Signals from Massachusetts and Connecticut are received in some parts of the state.

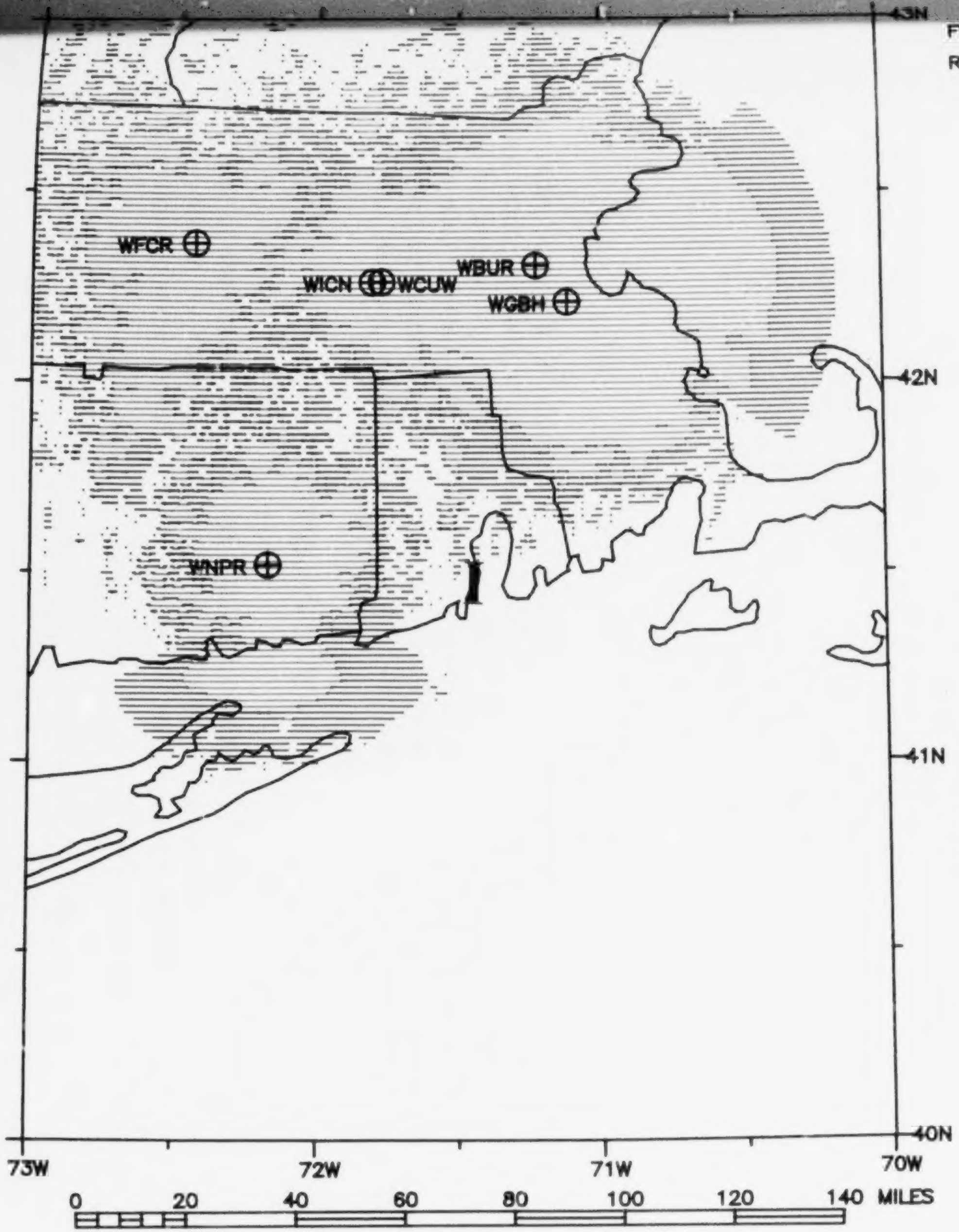
Uncovered Areas

Region I

Coverage in Rhode Island is spotty throughout but degrades substantially along the Atlantic coast, which is the location of Region I. In 1985, the Rhode Island Public Telecommunications Authority (RIPTA) was awarded funds by NTIA to develop a plan to bring public radio to the state. The study found that no radio frequencies were available for noncommercial educational stations. There is no indication that the situation has changed.

FM Educational Radio

Rhode Island



43N
42N
41N
40N
73W
72W
71W
70W
WFCR
WICN
WCUW
WBUR
WGBH
WNPR
0
20
40
60
80
100
120
140
MILES

Signal Coverage

▨ Primary (70 dBu)
Area: 300. sq mi
Population: 288000
Households: 104000

■ Secondary (60 dBu)
Area: 1200. sq mi
Population: 760000
Households: 273000

SOUTH CAROLINA

Basic Statistics

Total State Population:	3,122,000
Total Population Receiving Public Radio Signal:	2,920,000 (94%)
Total Population in Uncovered Areas:	202,000

Public Radio Stations in State

Community	Call Letters
Beaufort	WJWJ-FM
Charleston	WSCI-FM
Columbia	WLTR-FM
Conway	WHMC-FM
Greenville	WEPR-FM
Orangeburg	WSSB-FM
Rock Hill	WNSC-FM
Sumter	WRJA-FM

General Comments

Public radio service is provided to residents of South Carolina by the state-wide public radio network, licensed to the South Carolina Educational Television Commission, and WSSB-FM, licensed to the South Carolina State College in Orangeburg. Public radio signals are also received from the adjoining states of North Carolina and Georgia. Station WACG-FM. for example, is licensed to the Georgia Public Telecommunications Commission, Augusta, but its antenna is located on a tower in Aiken, South Carolina.

Uncovered Areas

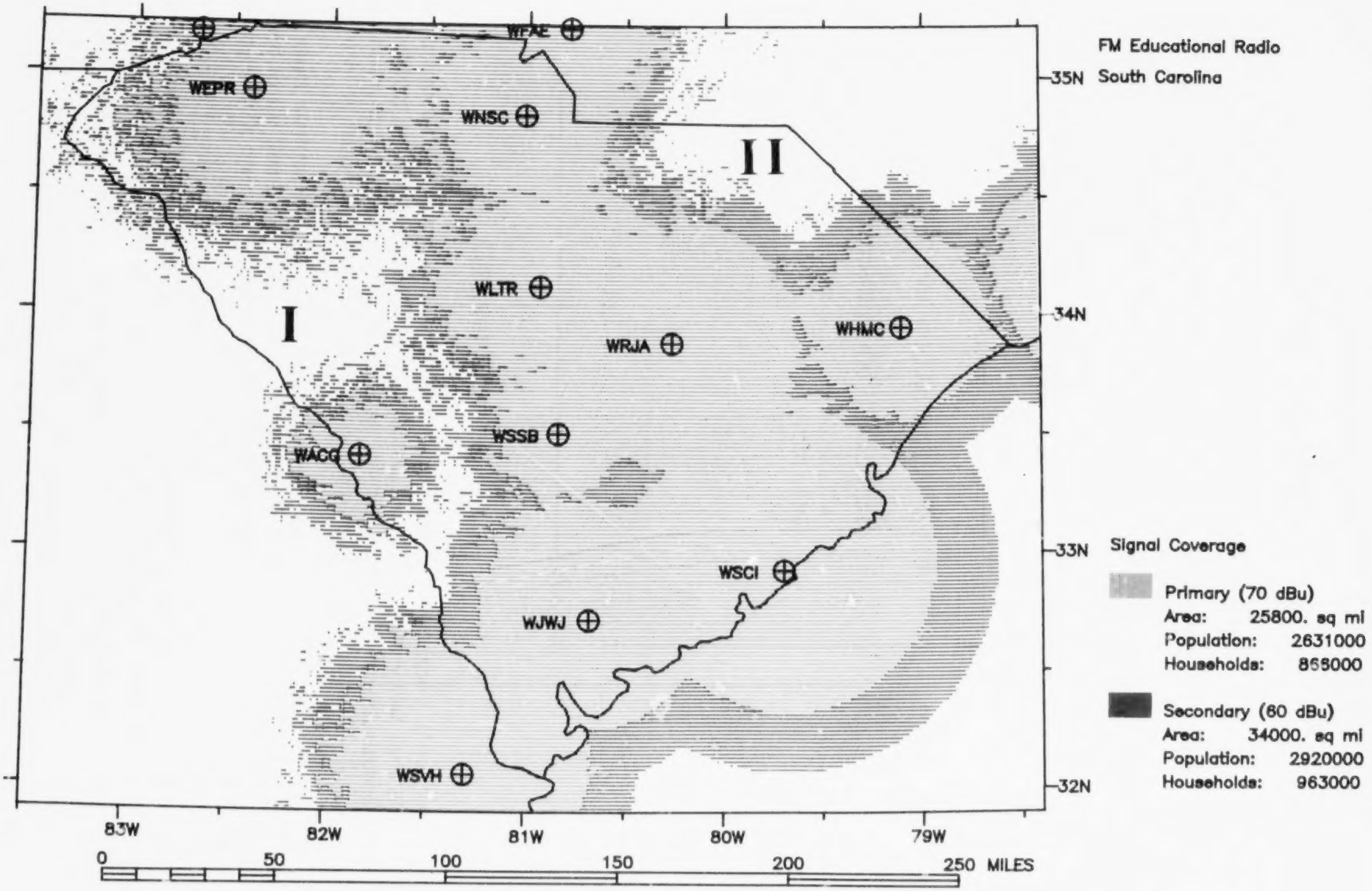
Two areas of the state appear to be uncovered. The state network is interested in providing service to both of these unserved regions. Potential channel 6 interference considerations, however, must be addressed before service can be provided.

Region I

Region I is north of the Aiken market. This area is dominated by the Sumter National Forest and is an area that will receive some improved coverage when a new Aiken public FM station is activated in early 1989. In addition to this new station, a state network official indicates that the network has petitioned the FCC to allocate a frequency to this area for public radio use. Due to channel 6 television station interference considerations, a commercial channel may have to be used for noncommercial use.

Region II

Region II, the uncovered area northwest of Dillon, is also within an area that is influenced by a channel 6 television station. Again, the state public radio official states that the Wilmington, North Carolina television station will have a major impact on any proposed use of the reserved public radio channels in this uncovered area.



FM Educational Radio
South Carolina

WFAE
WEPR
WNSC
II
WLTR
I
WHMC
WRJA
WSSB
WACG
WSCI
WJWJ
WSVH
35N
34N
33N
32N
83W
82W
81W
80W
79W
0
50
100
150
200
250 MILES
Signal Coverage
Primary (70 dBu)
Area: 25800. sq mi
Population: 2631000
Households: 868000
Secondary (60 dBu)
Area: 34000. sq mi
Population: 2920000
Households: 963000

SOUTH DAKOTA

Basic Statistics

Total State Population:	691,000	
Total Population Receiving Public Radio Signal:	506,000	(73%)
Total Population in Uncovered Areas:	185,000	

Public Radio Stations in State

Community	Call Letters
Brookings	KESD-FM
Lowry	KQSD-FM
Pierpont	KDSD-FM
Porcupine	KILI-FM
Rapid City	KBHE-FM
Reliance	KTSD-FM
Sioux Falls	KRSD-FM KCSD-FM
Vermillion	KUSD-FM KUSD-AM

General Comments

All well-settled areas of South Dakota are reached by a public radio signal. Since the remaining locations are remote and sparsely populated, it appears unlikely that the state could support any more full-service major stations. "White areas" will almost assuredly be reached only by major satellite repeaters and possibly some translators.

Of the ten major stations listed above, seven are part of the state public radio system, being licensed to the South Dakota Board of Directors for Educational Television. An eighth station, KCSD, operated by Sioux Falls College, is closely affiliated with the state system.

KILI, which is located on the Pine Ridge Indian Reservation in the southwestern part of the state, provides programming designed to serve the needs of the Sioux people of that area. Much of the programming is broadcast in the Lakota language. Thanks to a series of translators, KILI's signal either already reaches or shortly will reach a good part of the Cheyenne River Reservation and the communities of Rosebud and Rapid City.

(Another FM station, KINI, also provides general and specialized programming to the Sioux people of the Rosebud Indian Reservation, in south central South Dakota. KINI's city of license is Crookston, Nebraska, but its studios are located in St. Francis, SD, on the Reservation. Although KINI is operated on a noncommercial basis, the station has a commercial FM license and so its contours are not displayed on the accompanying map.)

South Dakota's public radio AM station, KUSD, broadcasts at a power of 1,000w during the day, but must reduce its power to 20.6w at night. During the nighttime hours, its coverage reach shrinks to about 20-30 miles. The station is, however, on-air for 24 hours a day, with a format that is the same as that of the state system's FM stations.

Uncovered Areas

We have identified five unserved regions in South Dakota, all of which are rural, with low population levels.

Region I

Region I is the northwest part of the state. In all likelihood, within the next 6-8 months this region will be served by a major satellite FM repeater to be located in the community of Faith. The new station will be part of the state's public radio system. With the addition of this new station, public radio signals will reach all but the extreme northwest corner of the state.

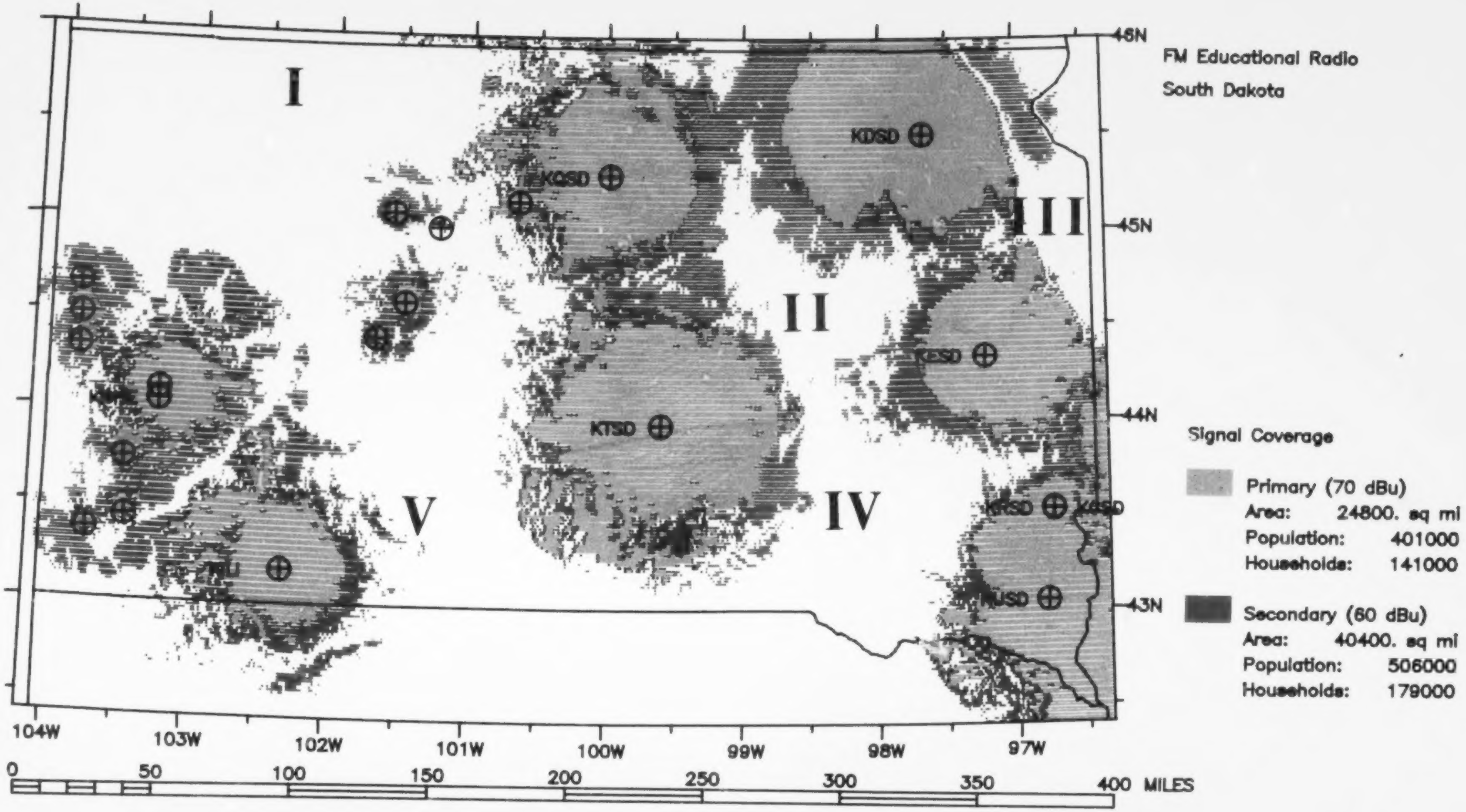
The addition of this new station will also, of course, increase the percentage of the state's population covered by public radio from the 73 percent noted in the statistics above.

Regions II, III, and IV

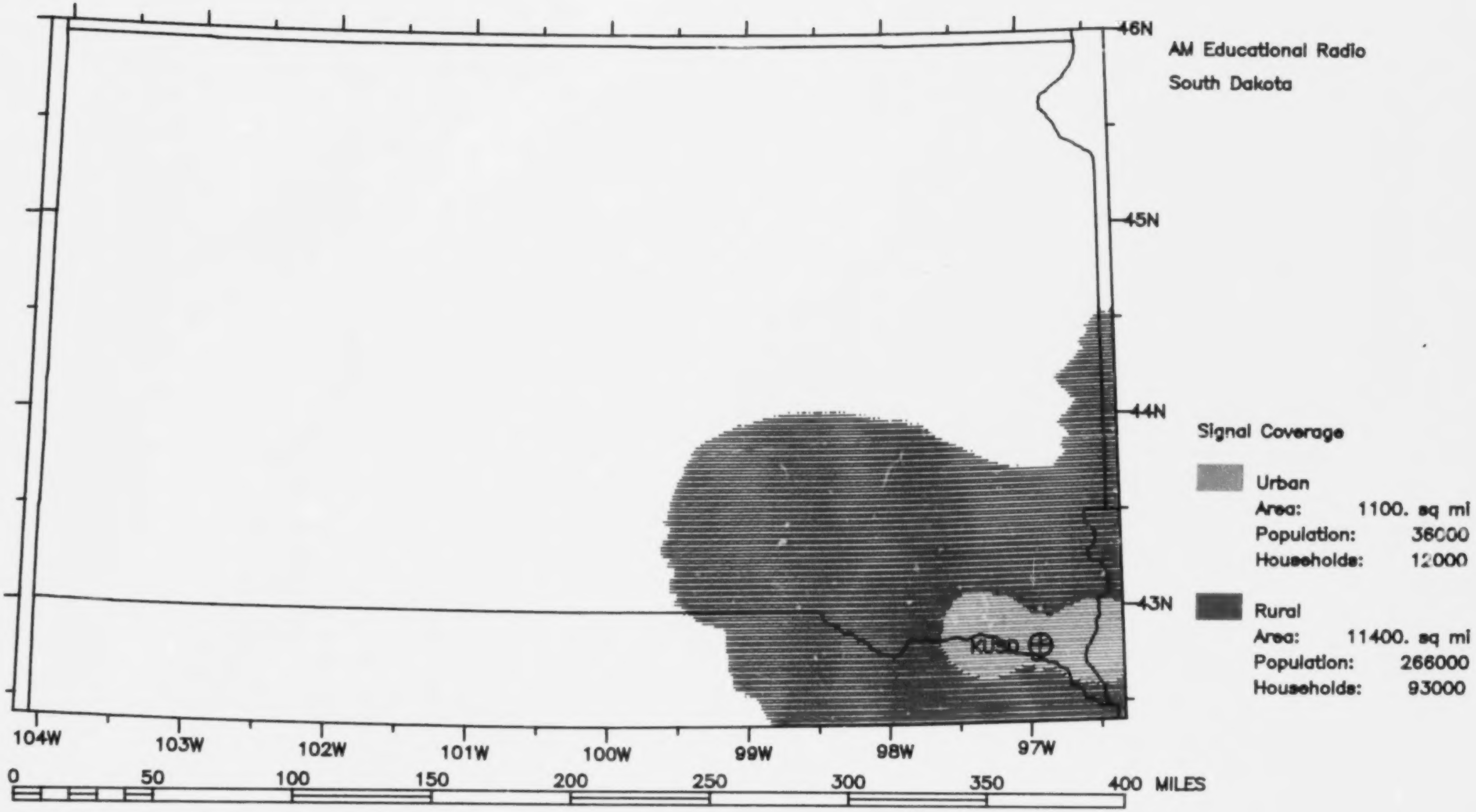
Some parts of these regions receive an acceptable signal below the 60 dBu level established for this study. In areas that are unserved or receive unacceptable signals, FM translators may be used to resolve the situation.

Region V

Region V would best be served by a major satellite repeater. The state system has applied at the Commission for a frequency to accomplish this. System officials report, however, that such a project is about two years away from fruition.


FM Educational Radio
South Dakota
Signal Coverage
Primary (70 dBu)
Area: 24800. sq mi
Population: 401000
Households: 141000
Secondary (60 dBu)
Area: 40400. sq mi
Population: 506000
Households: 179000
I
II
III
IV
V
KDSD
KQSD
KTSD
KESD
KRSD
KUSD
46N
45N
44N
43N
104W
103W
102W
101W
100W
99W
98W
97W
0
50
100
150
200
250
300
350
400 MILES

AM Educational Radio
South Dakota


46N
45N
44N
43N
KUSD
104W
103W
102W
101W
100W
99W
98W
97W
0
50
100
150
200
250
300
350
400 MILES
Signal Coverage
Urban
Area: 1100. sq mi
Population: 36000
Households: 12000
Rural
Area: 11400. sq mi
Population: 266000
Households: 93000

TENNESSEE

Basic Statistics

Total State Population:	4,591,000
Total Population Receiving Public Radio Signal:	3,723,000 (81%)
Total Population in Uncovered Areas:	868,000

Public Radio Stations in State

Community	Call Letters
Chattanooga	WUTC-FM
Collegedale	WSMC-FM
Johnson City	WETS-FM
Knoxville	WUOT-FM
Memphis	WEVL-FM WKNO-FM
Murfreesboro	WMOT-FM
Nashville	WPLN-FM

General Comments

Residents of Tennessee receive a public radio signal from a variety of public radio licensee types. The majority of the stations are licensed to universities. However, two Memphis stations, WEVL-FM and WKNO-FM, are licensed to nonprofit community-based educational organizations. WPLN-FM, in Nashville, is licensed a local authority, the Public Library of Nashville and Davidson County. There is no single statewide public radio network *per se*.

Uncovered Areas

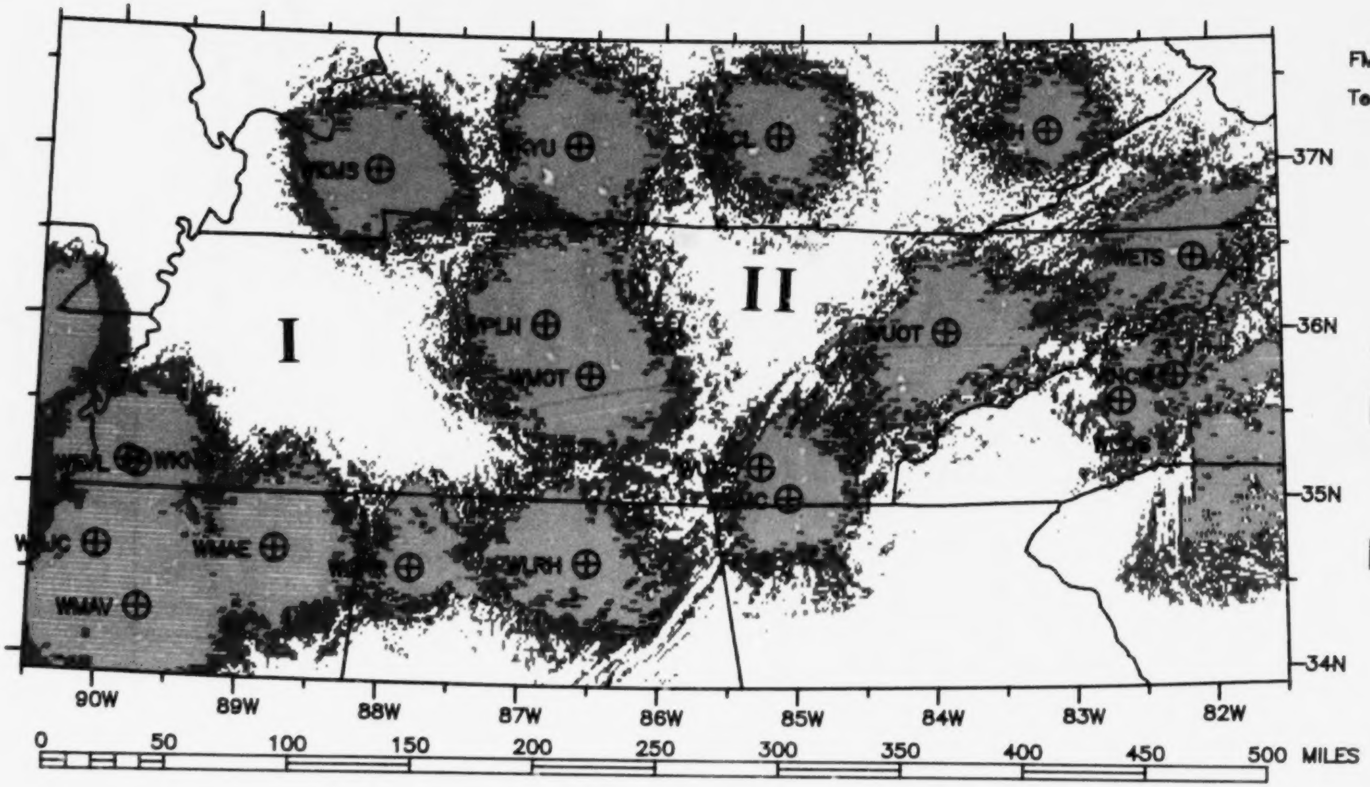
The following two regions appear to be uncovered:

Region I

This large region is northeast of Memphis and west and southwest of Nashville. It covers a major section of northwestern Tennessee and contains approximately 54 percent of the state's unserved population. The size of this area would appear to warrant the establishment of a public radio station. Station officials at WKNO-FM in Memphis have indicated that they are currently making final plans for the establishment of a new repeater/satellite radio station in the Jackson market. For the most part, the new station would repeat the WKNO-FM signal. WKNO-FM believes that the repeater/satellite station could eventually become a full-service public radio station with local origination.

Region II

This region is the unserved area located between the signal contours of the Nashville public station (WPLN-FM), the Murfreesboro station (WMOT-FM) and the Knoxville public station (WUOT-FM). It includes an estimated 46 percent of the unserved population of the state. The approximate center of this region would appear to be in the Cookeville/Crossville area. There are two possible ways to provide service to this area: a full-service station or a repeater/satellite station re-broadcasting the signal of one of the stations surrounding this unserved area. Both of these possibilities were discussed with a station official of WCTE-TV, channel 22, in Cookeville. We contacted WCTE-TV since its tower is ideally located between Cookeville and Crossville and might be a logical site for the location of any FM antenna. Either of the two approaches discussed above would appear to be a reasonable way to provide service to this area.


WKMS
WKYU
WPLN
WMOT
WUOT
WETS
WDCL
WLRH
WKNO
WMAE
WMAV
WUMC
WEVL
I
II
37N
36N
35N
34N
90W
89W
88W
87W
86W
85W
84W
83W
82W
0
50
100
150
200
250
300
350
400
450
500 MILES

FM Educational Radio

Tennessee

Signal Coverage

▨ Primary (70 dBu)
Area: 17800. sq mi
Population: 3271000
Households: 1153000

■ Secondary (60 dBu)
Area: 25400. sq mi
Population: 3723000
Households: 1309000

TEXAS

Basic Statistics

Total State Population:	14,229,000
Total Population Receiving Public Radio Signal:	10,903,000 (77%)
Total Population in Uncovered Areas:	3,326,000

Public Radio Stations in State

Community	Call Letters
Abilene	KACU-FM
Amarillo	KACV-FM
Austin	KAZI-FM KUT-FM
Beaumont	KVLU-FM
College Station	KAMU-FM
Commerce	KETR-FM
Corpus Christi	KKED-FM
Dallas	KERA-FM KNON-FM
Denton	KNTU-FM
El Paso	KTEP-FM KXCR-FM
Houston	KPFT-FM KTSU-FM KUHF-FM
Killeen	KNCT-FM
Prairie View	KPVU-FM
San Antonio	KPAC-FM KSTX-FM
Texarkana	KTXK-FM

General Comments

All the major populated areas of Texas are now, or shortly will be, served by a public radio signal.

This coverage has been achieved by autonomous stations. Thirteen of the above stations are operated by academic institutions; the remainder are community stations. Texas has no state system, nor do any Texas public radio stations receive any state financial support.

Very few out-of-state public radio signals are found in Texas. Station KDAQ-FM, Shreveport, Louisiana, does provide such a signal to a slice of extreme northeast Texas. In West Texas, Eastern New Mexico University's major satellite repeater, KMTH, in Maljamar, New Mexico, is now broadcasting its signal to FM translators in the Texas communities of Andrews and Midlands.

As will be discussed below in greater detail, the accompanying map does not display three stations that did not meet the criteria for this study's master list of stations. The three, however, either are or soon will be transmitting a public radio signal to their communities. Two already-active stations are in Lubbock and Odessa; one station yet to be established will be in Harlingen. The presence of these stations improves the public radio "map" of Texas.

Uncovered Areas

With few exceptions, the areas of Texas unserved by public radio are quite rural. In some cases they are isolated. They tend to be dominated by relatively small communities, although to be sure there are also many unserved communities of moderate size.

When considering the expansion of Texas public radio, the state of the economy is a factor of great significance. Many of the regions still unserved -- and, indeed, many of those already served -- have been for some time undergoing a severe recession. This diminishes opportunities for signal expansion.

Distance is another important consideration in understanding the difficulties of reaching the unserved areas of Texas. It is not uncommon for unserved communities to be a hundred miles or more from the nearest full-service public radio station.

One implication of this situation is that any entity wishing to extend its signal to an unserved area will first have to carefully calculate the project's economics. The cost of getting there via microwave could be prohibitively high and, once there, the community served might not be able to pay for the investment in equipment and maintenance.

It is probable, then, that many of the more remote locations in Texas may not be able to enjoy public radio for some time to come.

Moreover, it would appear that, with one exception (Harlingen, discussed below), we shall not witness the establishment of any more full-service, "stand-alone" stations in Texas. However, some of the larger unserved communities might conceivably succeed with a "Rocky Mountain Alternative Station." This is especially true of communities that display two characteristics:

- they lie relatively near already-established public radio stations whose signals they could repeat (such proximity would keep down microwave costs);
- they contain institutions of higher learning (which often are eager to sponsor such a station and at any rate are a ready source of volunteer personnel).

We have found four major unserved regions in Texas.

Region I

Region I is extreme west Texas, immediately to the east of El Paso. Here, the population density is extremely low. Worse yet, from the perspective of broadcasting, the terrain is extremely rugged. This combination will make public radio coverage very costly and thus difficult to achieve.

Probably the best hope for short-term signal extension is in the northeast part of this region, embracing the communities of Kermit, Monahans, and Pecos. The landscape is comparatively flat and thus signals could be brought in with relative ease either from the Odessa/Midland area or from southeast New Mexico. Cost considerations would suggest that a series of translators would be the best bet, although the terrain would allow for a strategically placed major satellite repeater.

It is also possible that Van Horn might be served by an FM translator repeating a signal transmitted from El Paso.

Region II

Region II is the vast stretch of central Texas from the Panhandle to the Rio Grande, west of the contours of the public stations running from Dallas to San Antonio.

Region II is by and large flat country. Toward the north (above Interstate Route 10) it contains numerous communities, most of which are very small. South of I-10, the population becomes sparse indeed.

In the western part of this region, Lubbock and Odessa are now served by stations that, because they did not fit the criteria for this study, are not displayed on the map. Lubbock's station, KOHM-FM, just recently expanded its broadcast day to 18 hours. It features a classical music format. It hopes to achieve CPB qualification within the near future. It also plans to increase its radiated power from 20 kw to 50 kw.

To the south of Lubbock, Odessa College's station -- KOCV-FM -- will begin broadcasting National Public Radio programs May 1989. Also, as noted above, KENW-FM, Portales, New Mexico, has placed FM translators in the communities of Andrews and Midland. The translators are picking up the signal of KENW's major satellite repeater in Maljamar, New Mexico.

In the extreme southeast of Region II, where we find the communities of Harlingen, Brownsville, and McAllen (Cameron and Hidalgo Counties), coverage may shortly be achieved by a "stand-alone", full-service station to be located in Harlingen. The project is the subject of a PTFP construction grant application.

The combined population of Andrews, Lubbock, Midland, Odessa and Harlingen is almost 550,000. If these communities were to be served, then the percentage of the total Texas population covered by public radio would increase to approximately 79 percent.

With respect to the remainder of unserved Region II, it seems possible that, if the distance problem can be surmounted, the larger communities, such as Wichita Falls, Laredo, San Angelo and Big Spring, may someday be served by satellite repeaters or at least by translators.

Some of these communities may be suitable for a Rocky Mountain Alternative Station. Under present circumstances, however, the more remote sections of the region may not receive public radio for some time.

Region III

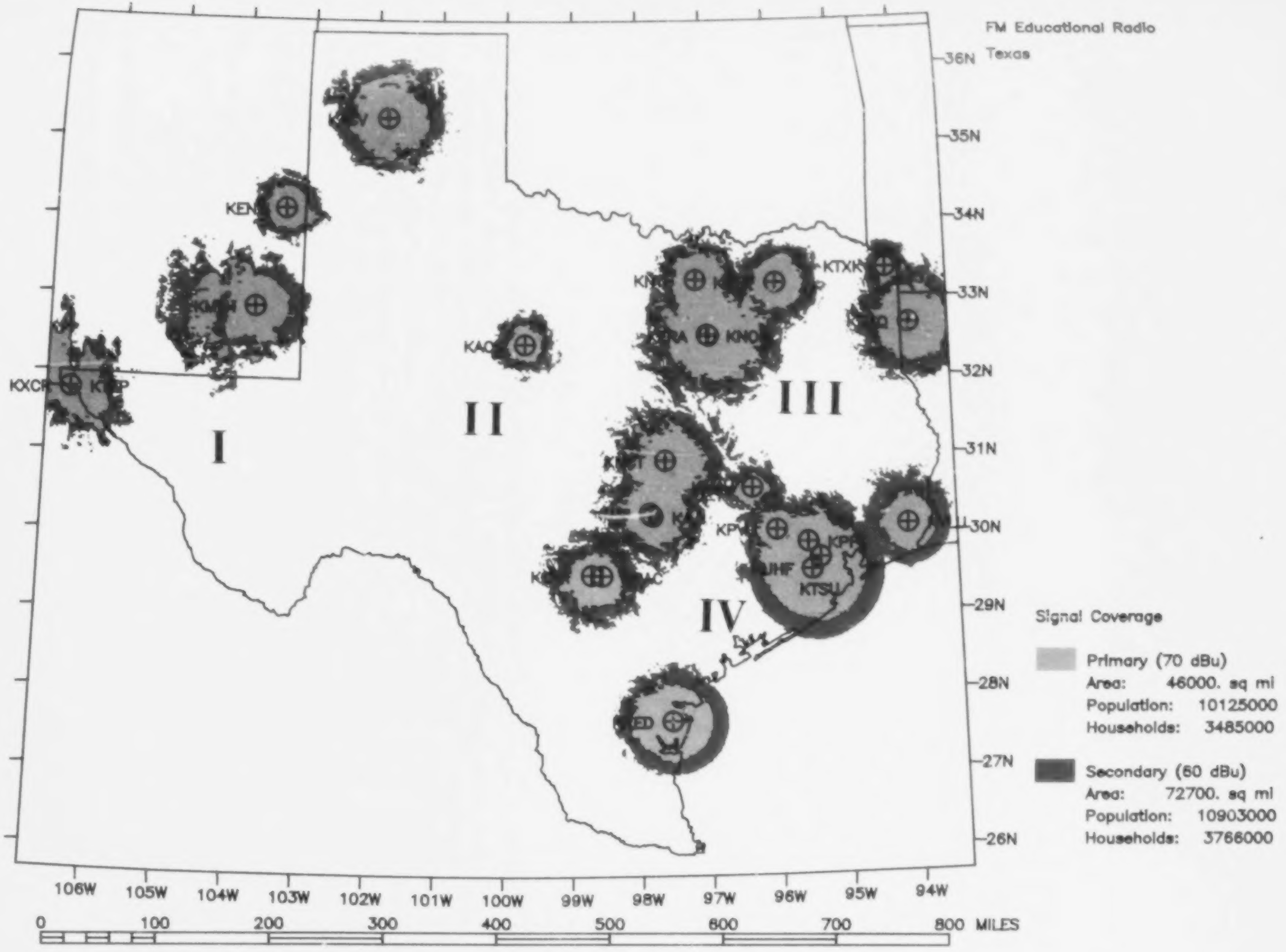
Region III is the northeast corner of the state. As was the case with Region II, certain larger communities -- Tyler (pop. 70,500) and Nacogdoches (pop. 46,786) are the most notable examples -- may receive service, either by translator or, if the financial calculations warrant, a major satellite repeater. A combination of a repeater and complementary translators could go a long way towards covering the populated sections of the region. The southern part of Region III, however, is composed to a large degree of national forests and lake regions and this will serve as a disincentive for any public radio entity seeking to expand its service there.

Region IV

Region IV is the area between Houston and Corpus Christi. The largest community is Victoria. One public broadcasting staff member suggested that a 50 kw repeater station in Victoria (pop. 51,000) would cover much of this region. The region, however, has been going through a period of severe economic recession lately and thus such a project might not be justifiable on financial grounds quite yet.

FM Educational Radio

Texas


36N
35N
34N
33N
32N
31N
30N
29N
28N
27N
26N
106W
105W
104W
103W
102W
101W
100W
99W
98W
97W
96W
95W
94W
0
100
200
300
400
500
600
700
800 MILES
I
II
III
IV
KEN
KMBH
KXCR
KTEP
KAC
KNC
KERA
KNON
KTXK
KPVU
KPFT
UHF
KTSU
KET
Signal Coverage
Primary (70 dBu)
Area: 46000. sq mi
Population: 10125000
Households: 3485000
Secondary (60 dBu)
Area: 72700. sq mi
Population: 10903000
Households: 3766000

UTAH

Basic Statistics

Total State Population: 1,461,000

Total Population Receiving Public Radio Signal: 1,266,000 (87%)

Total Population in Uncovered Areas: 195,000

Public Radio Stations in State

Community	Call Letters
Logan	KUSU-FM
Park City	KPCW-FM
Provo	KBYU-FM
Salt Lake City	KUER-FM KRCL-FM

General Comments

Utah is divided north to south by the Wasatch Mountain Front. This natural boundary has been a major factor in the development of a statewide telecommunications system. PTFP has, over the last six years, supported the development of a Utah telecommunications system -- called EDNET -- through the University of Utah, Salt Lake City. This multi-faceted system is providing a variety of services to the state in addition to distributing public broadcast signals statewide.

Uncovered Areas

Region I

This is the area of the Great Salt Lake Desert and is for the most part, unpopulated. The only area with significant population is the city of Tooele, population 14,000. The state telecommunications system has plans to provide service to this area in the near future. The balance of these lands are restricted access areas such as Dugway Proving Grounds and Wendover Range.

Region II

This region includes the Uinitas Mountains, the Wasatch National Forest and The Uinitas and Ouray Indian Reservations, all of which are sparsely populated. A number of smaller towns -- with populations less than 1,500 -- on the reservation along the southern section of this area are presently unserved. Translators may be a way of bringing service to some of these small communities.

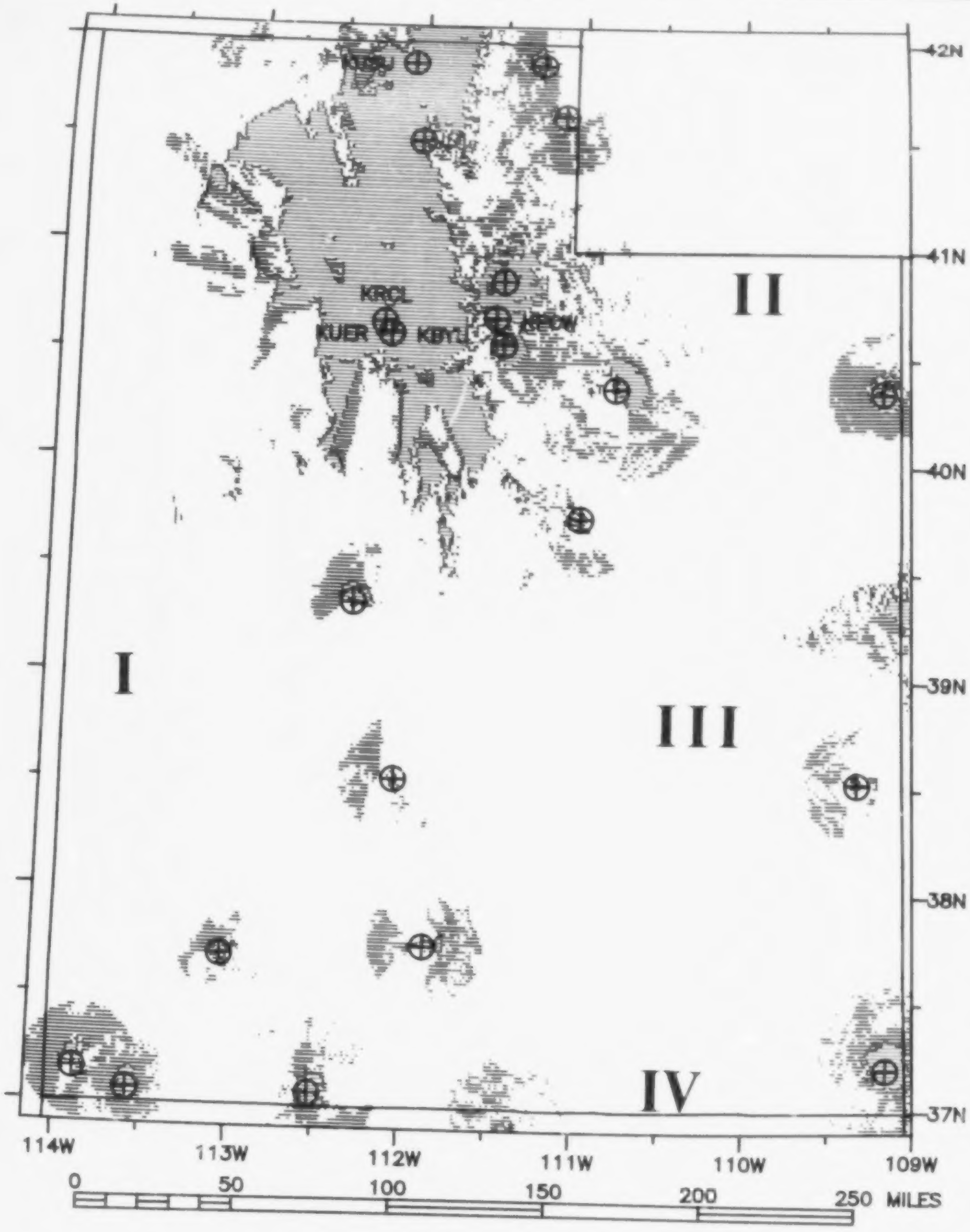
Region III

Price, population 9,086, and Moab, population 5,333, are the largest towns in this region. Recently the state telecommunications network extended part of its "backbone" microwave system to Price so that the signal of KUER-FM can be delivered to that city. Moab is not presently part of the state network plan. It may be possible to serve the smaller communities by installing translators.

Region IV

This area includes the northern section of the Navajo Reservation and the Glen Canyonlands National Park. The larger towns in the area, Blanding and Montecello, are presently served by a translated KUER-FM signal. The other towns in the area have less than 100 persons and therefore may be unable to support even a translated signal.

FM Educational Radio
Utah


KUSU
KRCL
KUER
KBYU
KPCW
I
II
III
IV
42N
41N
40N
39N
38N
37N
114W
113W
112W
111W
110W
109W
0
50
100
150
200
250 MILES

Signal Coverage

▨ Primary (70 dBu)

Area:	8300. sq mi
Population:	1190000
Households:	363000

▨ Secondary (60 dBu)

Area:	15800. sq mi
Population:	1266000
Households:	387000

VERMONT

Basic Statistics

Total State Population:	511,000
Total Population Receiving Public Radio Signal:	446,000 (87%)
Total Population in Uncovered Areas:	65,000

Public Radio Stations in State

Community	Call Letters
Burlington	WVPS-FM
Rutland	WRVT-FM
Windsor	WVPR-FM

General Comments

Public radio coverage in the state is provided by Vermont Public Radio (VPR). Out-of-state signals are available from New York and Massachusetts. VPR network can be fed from the studios located in Winooski/Burlington or Windsor. Brattleboro and Bennington are the only populated Vermont communities not served by VPR. Both communities, however, do receive a signal from WAMC-FM (Albany, New York) via a repeater transmitter located on the Massachusetts border.

Vermont has major mountain ranges running north and south, the length of the state, approximately west and east of the lateral midpoint. There are other major mountains and high elevations throughout the state, all of which have a major impact on the reception of broadcast signals.

Uncovered Areas

The majority of Vermont receives a public radio signal. This is a mountainous state and the areas that are uncovered are primarily pockets where the terrain or power limitations of existing equipment prevents signal penetration or dependable signal coverage.

Regions I and II

Regions I and II are mountainous areas with sparsely populated communities. Some areas within these regions are not populated.

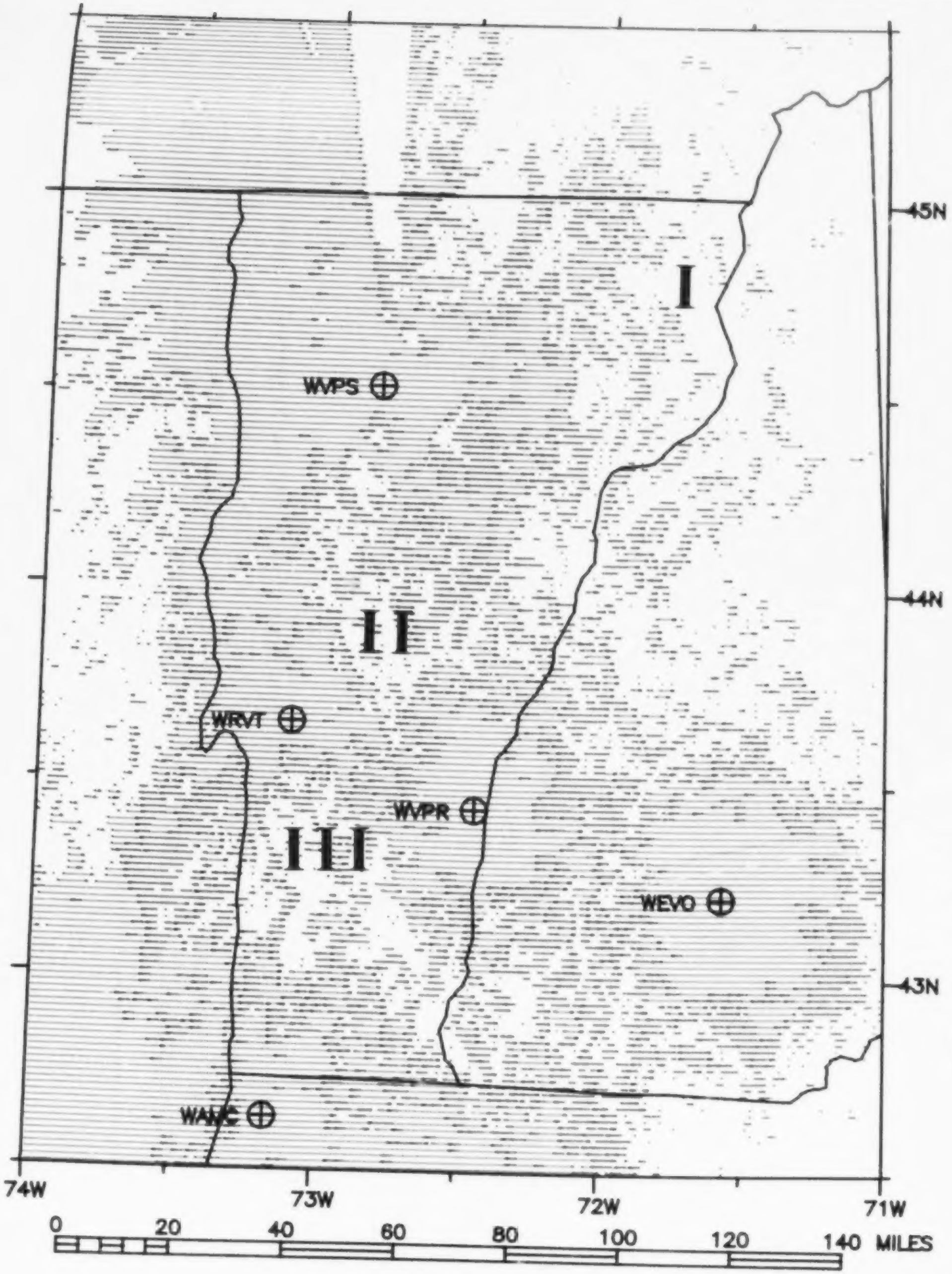
Technically, translators could provide signals to the uncovered areas, however, because of the large number of multiple units that would be necessary to cover every unserved pocket, the cost-effectiveness and practicality, especially with respect to maintenance, may be questionable.

Region III

The largest number of unserved population is to be found in Region III, which is located to the west and south of Rutland. Within a year, coverage will be brought to these areas by a transmitter, the purchase of which was assisted by a recent PTFP grant. Downtown Brattleboro is in a low spot and does not receive a 60 dBu-strength signal, although it does receive fringe signals from WVPR, Windsor, as well as signals from New York and Massachusetts.

FM Educational Radio

Vermont


45N
44N
43N
74W
73W
72W
71W
0
20
40
60
80
100
120
140 MILES
I
II
III
WVPS
WRVT
WVPR
WEVO
WAMC

Signal Coverage

▨ Primary (70 dBu)

Area:	6800. sq mi
Population:	355000
Households:	122000

■ Secondary (60 dBu)

Area:	9400. sq mi
Population:	446000
Households:	155000

VIRGINIA

Basic Statistics

Total State Population:	5,347,000
Total Population Receiving Public Radio Signal:	4,565,000 (85%)
Total Population in Uncovered Areas:	782,000

Public Radio Stations in State

Community	Call Letters
Charlottesville	WVTU-FM
Harrisonburg	WMRA-FM
Norfolk	WHRO-FM
Petersburg	WVST-FM
Richmond	WCVE-FM
Roanoke	WVTF-FM

General Comments

Public radio in Virginia is provided by a combination of community entities and educational institutions. The Division of Educational Technology is the state agency designated to coordinate public TV and radio in the state. Expansion of radio into unserved areas appears to be initiated primarily by individual stations. Mountains along the border between Virginia and West Virginia have been barriers to overcome in expanding radio coverage.

Uncovered Areas

Region I

Containing about 29 percent of the state's unserved population, Region I begins just east of the Blue Ridge Mountains and extends to the Chesapeake Bay area. Signals on the western side are effectively stopped by the mountains. The signals that stop above the middle of Region I are the edge of signals that serve the Washington D.C. metropolitan area. Power increases for existing stations surrounding the region, or translators or repeater transmitters from those stations could be used to serve this area if technical problems do not prohibit such service.

Region II

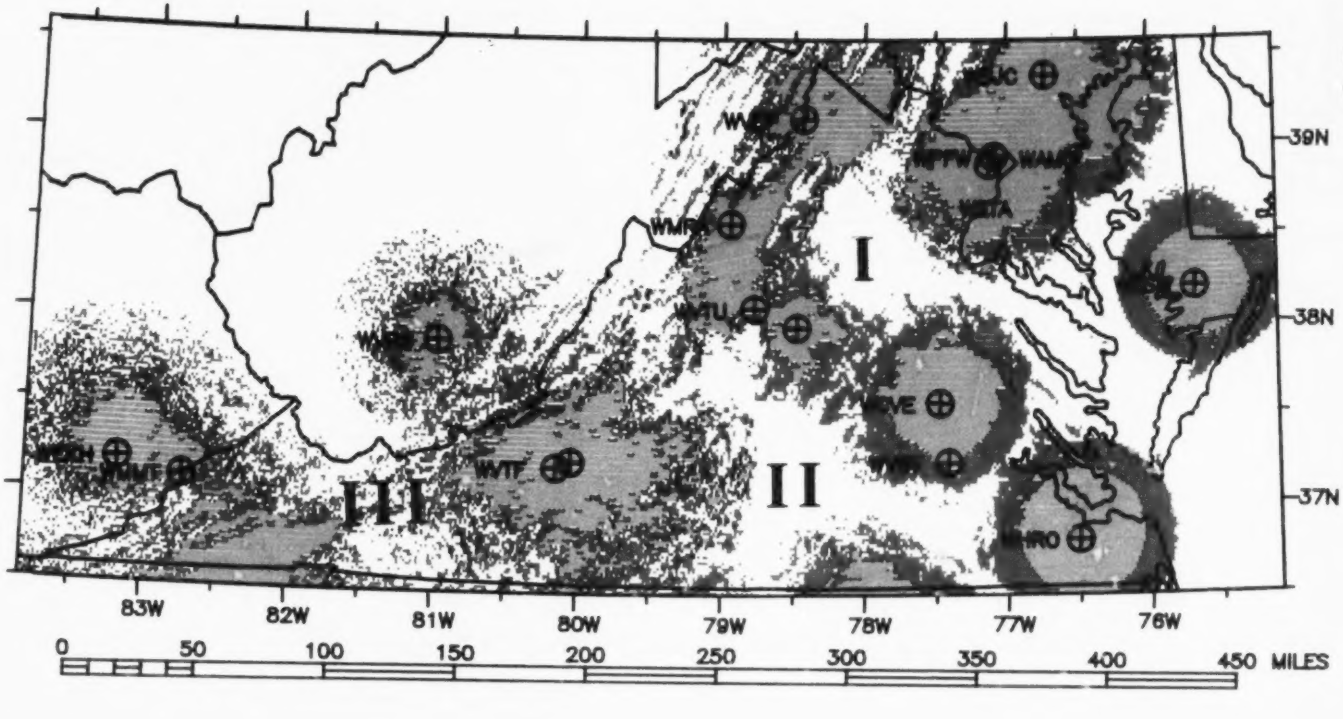
Region II is primarily rural in nature and the estimated 47 percent of the state's population residing here is unserved for several reasons. The northern half of the region lies between two mountain ranges. Coverage is spotty or non-existent because mountains are natural barriers to radio waves. The lower or southern half of the region is not mountainous. A full service facility or a high-power repeater transmitter could technically provide service to most of this portion of the region. Because of the low population mass, the economic and technical viability would require examination.

Region III

In Region III, coverage is spotty because of its mountainous topography. Translators might be the most effective means of providing coverage to the pockets of population in this area. About 24 percent of Virginia's unserved population resides in this area.

FM Educational Radio

Virginia


WBJC
WPFW
WAMU
WETA
WMRA
WVTU
WCVE
WVTF
WMMT
WHRO
I
II
III
39N
38N
37N
83W
82W
81W
80W
79W
78W
77W
76W
0
50
100
150
200
250
300
350
400
450 MILES

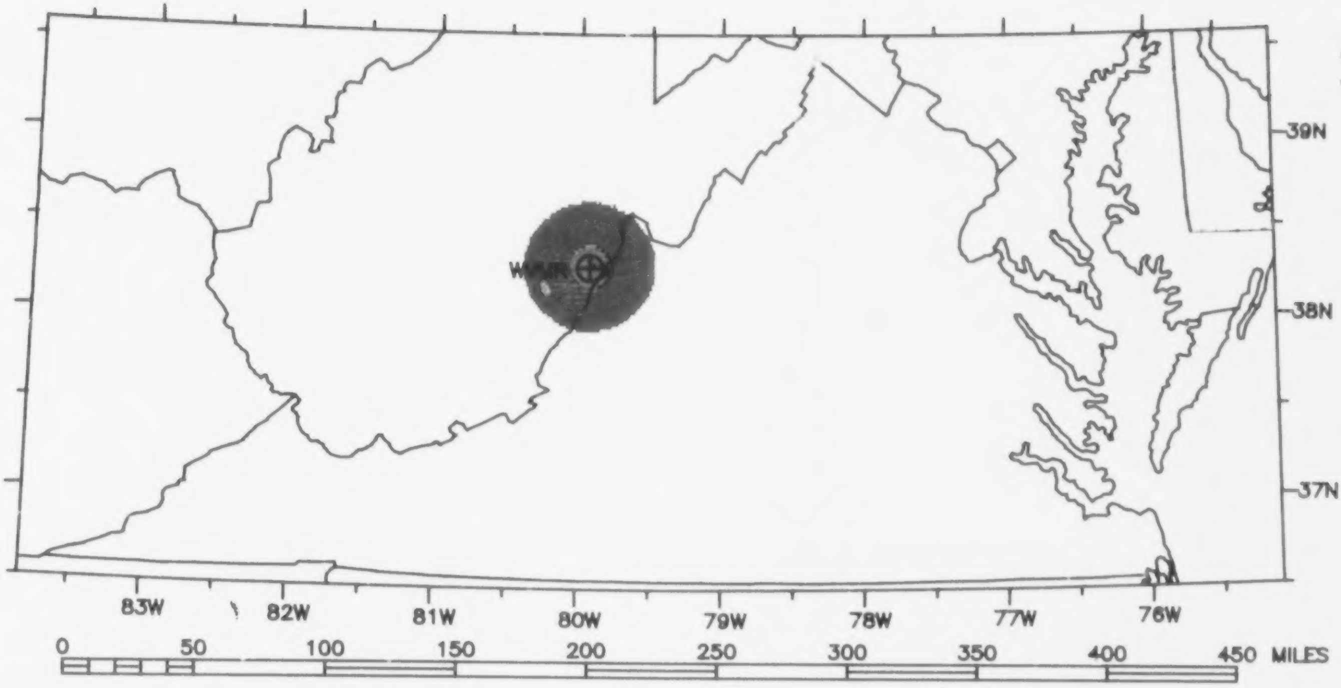
Signal Coverage

▨ Primary (70 dBu)

Area:	15600. sq mi
Population:	3904000
Households:	1369000

▨ Secondary (60 dBu)

Area:	25900. sq mi
Population:	4565000
Households:	1593000


WVMR
39N
38N
37N
83W
82W
81W
80W
79W
78W
77W
76W
0
50
100
150
200
250
300
350
400
450 MILES

AM Educational Radio
Virginia

Signal Coverage

▨ Urban
Area: 100. sq mi
Population: 0
Households: 0

▨ Rural
Area: 800. sq mi
Population: 8000
Households: 3000

WASHINGTON

Basic Statistics

Total State Population:	4,132,000	
Total Population Receiving Public Radio Signal:	3,744,000	(91%)
Total Population in Uncovered Areas:	388,000	

Public Radio Stations in State

Community	Call Letters
Granger	KDNA-FM
Olympia	KAOS-FM
Pullman	KWSU-AM
Richland	KFAE-FM
Seattle	KUOW-FM
Spokane	KPBX-FM
Tacoma	KPLU-FM KTPS-FM

General Comments

The Cascade Mountain range, running from the Canadian border to the Oregon border, divides Washington into two parts. The western portion of Washington State, with a majority of the state's population, is served by four public radio stations. These stations are all located in the Puget Sound area. Two stations in Tacoma and a station in Seattle serve the Seattle-Tacoma metropolitan area. A public radio station is also located in the state capital of Olympia.

KUOW, Seattle, operates a translator in Bellingham in northern Puget Sound, and KPLU, Tacoma, operates several translators in both the northern and southern portions of western Washington.

Southwestern Washington also receives public radio service from Oregon stations KMUN, Astoria and the public radio stations in Portland.

Central Washington, east of the Cascade Mountains, is served by KDNA, which provides a program service to the Hispanic audience of the Yakima valley and has a repeater in Pasco. KPBX serves northeastern Washington, Spokane and northern Idaho. Washington State University in Pullman operates KWSU-AM, and also two FM stations, KRFA, licensed to Moscow, Idaho, and repeater station KFAE, Richland. The AM station operates 18 hours a day while the FM stations provide twenty-four-hour-a-day program services. The AM urban service extends west of Pullman, but this additional service is not included in the above population coverage figures. A series of translators extends Washington State Radio service throughout southeast and central Washington.

Uncovered Areas

Region I

North central Washington consists of the mountainous Colville and Okanogan National Forests adjoining the Canadian border and sparsely populated desert areas west of Spokane to the Cascade Mountains. Reception of public radio throughout this area is spotty depending on terrain. While there is one translator in Omak, reception is poor in the Okanogan Valley, the Methow Valley and in the areas near Republic and Curlew.

Region II

Washington State University has received a construction permit for a translator in Chelan and has a strong interest in upgrading its radio services into the Ellensburg and Yakima areas by replacing its translators with a station in this area. KDNA would also like to expand service in this area to serve Hispanic communities in Othello, Royal City and Mattawa.

Region III

The Cascade Mountain range extending the length of Washington from the Canadian to the Oregon border consists of continuous national forest, national parks and wilderness areas.

Region IV

North Sound Public Radio has applied for a construction permit from the Federal Communications Commission to construct a public radio station in Bellingham, with translators extending the service to Puget Sound communities including Anacortes, Mt. Vernon, Sequim, Friday Harbor, Oak Harbor and Coupeville. The project has been delayed due to possible interference with FM stations in Canada. The Jack Straw Foundation, which operated KRAB-FM in Seattle prior to its sale to commercial interests, has plans to construct a noncommercial station in Everett.

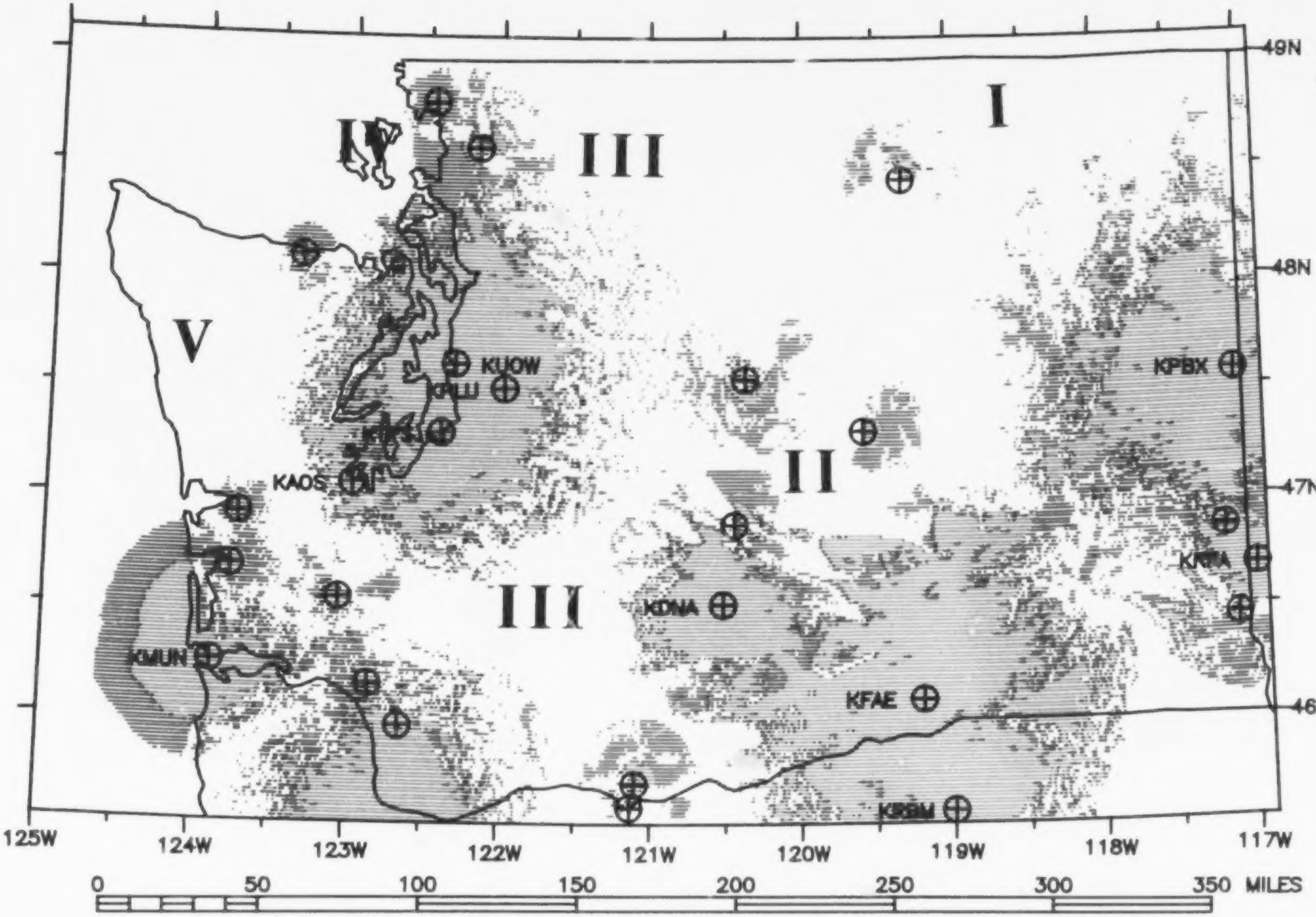
Region V

The Olympic Peninsula consists of Olympic National Park and surrounding National Forest. Port Angeles and the major population centers on the northern shore of the Olympic Peninsula receive service via KPLU translator.

About 61 percent of Washington's unserved population resides in Region III while Regions II and V each contain about 15 percent of the unserved residents.

FM Educational Radio

Washington


49N
48N
47N
46N
125W
124W
123W
122W
121W
120W
119W
118W
117W
0
50
100
150
200
250
300
350 MILES
I
II
III
III
IV
V
KPBX
KUOW
KPLU
KTPS
KAOS
KMUN
KDNA
KFAE
KRBM
KRFA

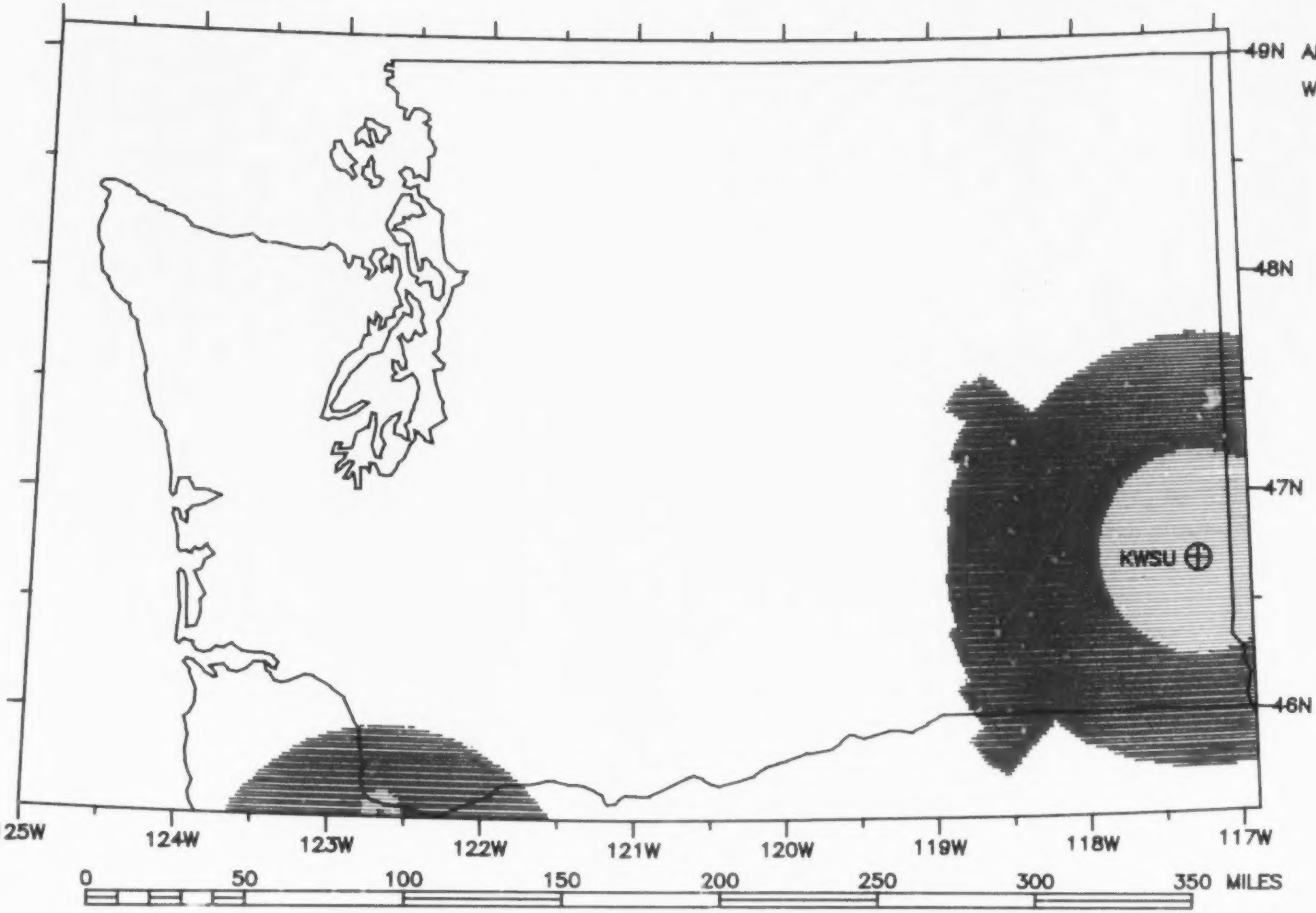
Signal Coverage

▨ Primary (70 dBu)
Area: 19500. sq mi
Population: 3458000
Households: 1281000

■ Secondary (60 dBu)
Area: 29400. sq mi
Population: 3744000
Households: 1390000

AM Educational Radio

Washington


49N
48N
47N
46N
125W
124W
123W
122W
121W
120W
119W
118W
117W
KWSU
0
50
100
150
200
250
300
350 MILES

Signal Coverage

▨ Urban
Area: 2200. sq mi
Population: 133000
Households: 51000

■ Rural
Area: 10100. sq mi
Population: 582000
Households: 215000

WEST VIRGINIA

Basic Statistics

Total State Population:	1,950,000
Total Population Receiving Public Radio Signal:	1,361,000 (70%)
Total Population in Uncovered Areas:	589,000

Public Radio Stations in State

Community	Call Letters
Beckley	WVPB-FM
Buckannon	WVPW-FM
Charleston	WVPN-FM
Huntington	WVWV-FM
Martinsburg	WVEP-FM
Marlington	WVMR-AM
Morgantown	WVPM-FM
Parkersburg	WVPG-FM
Wheeling	WVNP-FM

General Comments

By charter, the West Virginia Educational Broadcasting Authority (WVEBA) is the state agency mandated to provide public radio and television to the citizens of West Virginia. It is almost the exclusive provider of public broadcasting in the state. The flagship station, located in Charleston, feeds seven repeater transmitters throughout the state. The stations are connected by microwave and serve the most populated cities.

Mountains, the dominant topographical feature in West Virginia, are physical obstacles to establishing new service. Building a facility in rugged terrain requires exorbitant expenditures for power lines, installation of equipment and on-going maintenance. Before new broadcast facilities are installed, then, confirming engineering data would be necessary and the cost effectiveness of service compared to the increased operational and installation expenses would require analysis.

Uncovered Areas

Public radio reaches 70 percent of West Virginia residents, but there are "white areas." Signal coverage is spotty in several mountainous areas and between station signals.

Regions I and II

Regions I and II include the National Radio Astronomy Observatory, the presence of which has led to the establishment of a Quiet Zone that is located in the Mononghela National Forest and extends into the George Washington National Forest. The Quiet Zone is mountainous and sparsely populated and there are severe restrictions on radio waves of any kind coming into the area. An exception is WVMR-AM, a community radio station, which is located in the Quiet Zone within our unserved Region II. The station operates with a transmission power of 5 kw. It is, however, a daytime-only station. The greater part of the Quiet Zone is uncovered.

Keyser, an unserved community in Region I in the eastern panhandle, was the subject of a prior FCC application by WVEBA. It was eventually withdrawn due to out-of-state opposition. However, it was the original intent of WVEBA to serve this area with a repeater transmitter.

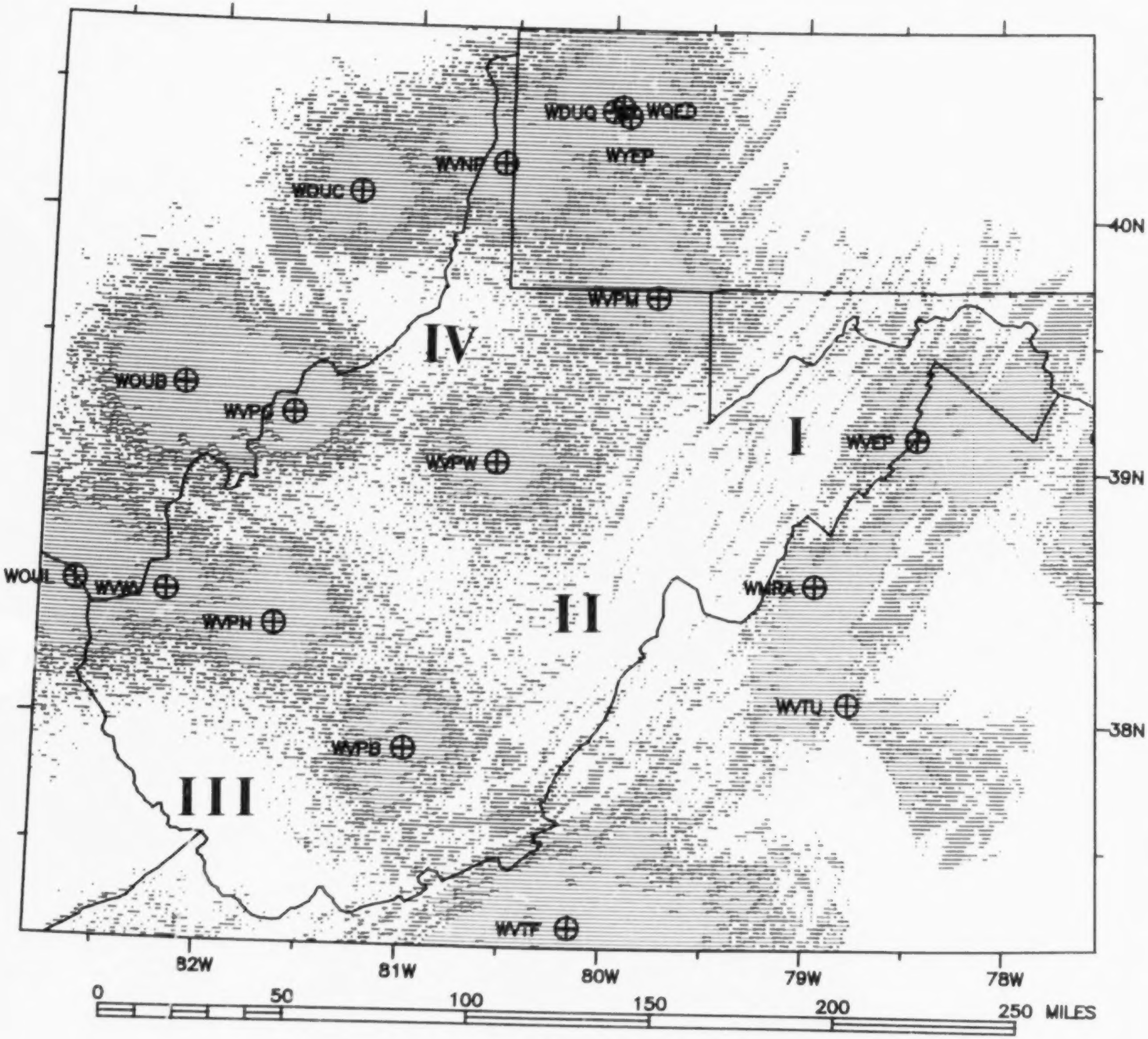
Region III

Region III is located in the southwest curve of the state. The most populated unserved community in this area is Bluefield. A system of a repeater transmitter feeding translators to the northwest, might cover this area. We estimate that slightly over half the state's unserved residents live in Region III.

Region IV

Region IV, the unserved northern portion of the state, is in the area between the signals of WVPG, WVPM and WVNP. It contains perhaps 25 percent of the West Virginia's unserved residents. It is possible that this "white space" could be served by a repeater transmitter placed in Clarksburg, the most populated community in the area, which could then feed a series of translators to the west.

FM Educational Radio
West Virginia

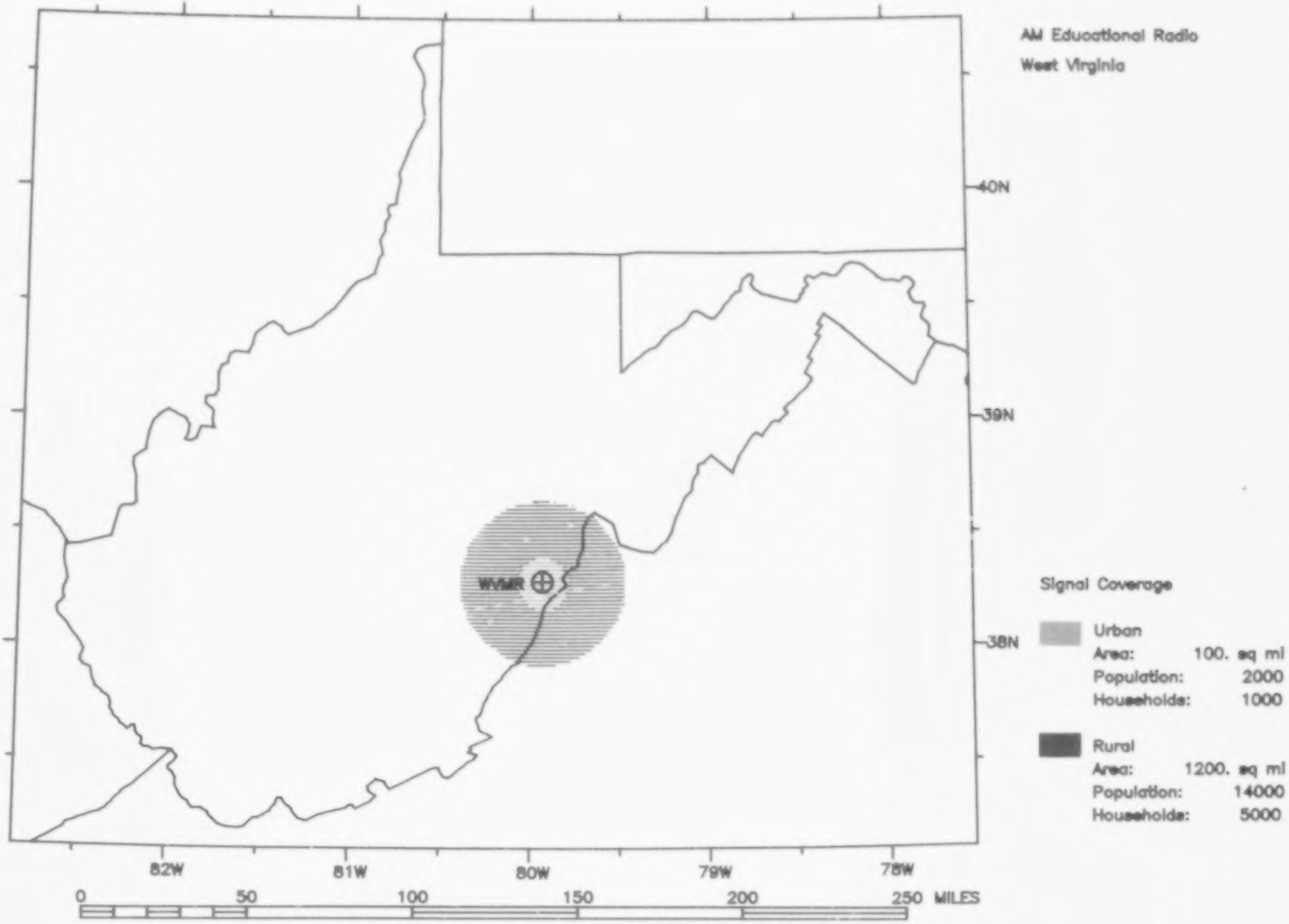

WDUQ
WQED
WYEP
WVNP
WDUC
WVPM
IV
WOUB
WVPG
WVPW
I
WVEP
WOUL
WVWV
WVPN
II
WMRA
WVTU
WVPB
III
WVTF
40N
39N
38N
82W
81W
80W
79W
78W
0
50
100
150
200
250 MILES

Signal Coverage

▨ Primary (70 dBu)		
	Area:	7700. sq mi
	Population:	971000
	Households:	347000
▨ Secondary (60 dBu)		
	Area:	13000. sq mi
	Population:	1361000
	Households:	485000

AM Educational Radio

West Virginia


40N
39N
38N
82W
81W
80W
79W
78W
0
50
100
150
200
250 MILES
WVMR
Signal Coverage
Urban
Area: 100. sq mi
Population: 2000
Households: 1000
Rural
Area: 1200. sq mi
Population: 14000
Households: 5000

WISCONSIN

Basic Statistics

Total State Population:	4,706,000
Total Population Receiving Public Radio Signal:	4,252,000 (90%)
Total Population in Uncovered Areas:	454,000

Public Radio Stations in State

Community	Call Letters
Appleton	WLFM-FM
Auburndale	WLBL-AM
Brule	WHSA-FM
Delafield	WHAD-FM
Green Bay	WGBW-FM WPNE-FM
Hayward	WOJB-FM
Highland	WHHI-FM
Kenosha	WGTD-FM
La Crosse	WHLA-FM WLSU-FM
Madison	WERN-FM WHA-AM WORT-FM
Menomonie	WHWC-FM
Milwaukee	WUWM-FM WYMS-FM
Oshkosh	WRST-FM
Park Falls	WHBM-FM
Rhinelander	WXPR-FM
Wausau	WHRM-FM

General Comments

All of the heavily populated areas of Wisconsin are well covered by public radio signals. Many regions receive more than one signal. Moreover, the Wisconsin State Educational

Communications Board ("the Board") has prepared plans that will result in great reductions in the remaining "white areas." These plans will be discussed below.

This comprehensive coverage has been achieved through a combination of autonomous stations and a system of nine major FM satellite repeaters operated by the Board.

To a great extent, programming on state and community issues transmitted over the state system originates at the studios of WERN-FM, Madison. The state stations at Green Bay, Menomonie, and Wausau, however, also have some local origination capability.

Wisconsin also has two educational AM stations. WLBL-AM, in the community of Auburndale, is a daytime-only station. A recently installed upgraded ground system for its antenna has improved its coverage and signal quality. WHA-AM, in Madison, is on the air 20 hours a day Monday-Friday and 19 hours a day Saturday and Sunday. At night, however, its authorized 5 kw daytime signal drops to 42 w, which shrinks its coverage area to Madison and the immediate environs. Both stations emphasize news and informational programming.

Uncovered Areas

All areas in Wisconsin remaining unserved by public radio are rural, sparsely populated and, in some cases, relatively isolated. To some degree, therefore, extending signals to these areas poses economic risk. Nonetheless, as noted above, to reach the unserved areas, the Board is planning to expand the coverage of some of its already-existing stations and to construct new stations. The target dates for completion of some of these efforts are imminent. Other projects are designed to be performed over a longer term.

It is not anticipated, however, that any additional full-service, full-power stations will be constructed.

Three channel 6 television stations either in or close to Wisconsin partly inhibit the Board's efforts to reach the unserved regions. The channel 6 stations are in Milwaukee and in Austin and Duluth, Minnesota.

The patterns of the unserved regions in Wisconsin are for the most part irregular and ragged. Also, many of the "served" areas have coverage that is spotty. This makes is difficult to calculate exact population totals for the regions we have identified as being unserved. We have, however, estimated that Regions I and II together may have only about 20,000 to 25,000 unserved people. Regions III and IV appear to have, respectively, approximately 25-30 percent and about 60 percent of Wisconsin's unserved residents.

Region I

The situation in unserved Region I, in the northwest corner of the state, may be improved by the Board's plans to increase the power of WHWC-FM in Menomonie. The increase will be from 10 kw to 25 kw ERP. Any further increase is precluded by the presence of the channel 6 station in Austin, Minnesota.

The WHWC transmission power upgrade will also reduce the "white area" to the east of the station. This is part of our unserved Region IV.

Also pertinent to unserved Region I are the Board's plans to eventually contruct a Class A FM station in the community of Webster, which is toward the north of this unserved region. Such a station would presumably go a long way towards closing the gap in service in Region I.

Region II

Region II is also in the northwest corner of the state. It includes the Bayfield Peninsula and the sites of the Red Cliff and Bad River Indian Reservations. Board plans for the upgrading of KUWS-FM (formerly WSSU-FM), a noncommercial station in Superior, may affect this region. (KUWS is not shown on the accompanying map.) The Board intends to increase the station's ERP from 960 w to 89 kw and to take staffing and management steps pointed towards making KUWS a full service station. KUWS's expanded contours may reach unserved Region II. If it turns out that they do not, then the Board will consider installing a translator or a Class A station in Ashland.

Region III

Region III is the northeast corner of the state. This area is very sparsely populated and may have to wait a while for reliable coverage. In the Board's long-range planning, it is considering placing an FM satellite repeater in the community of Fence, in Florence County. There, the Board would be able to take advantage of already existing transmission facilities of its TV translator.

Region III also includes the end of the Door Peninsula, north of Green Bay. Here again, the Board is pondering whether to construct an FM translator or a Class A FM station to reach this unserved area.

Region IV

Region IV is the vast, crescent-shaped unserved area that curves through the center of the state. We shall consider coverage plans from east to west.

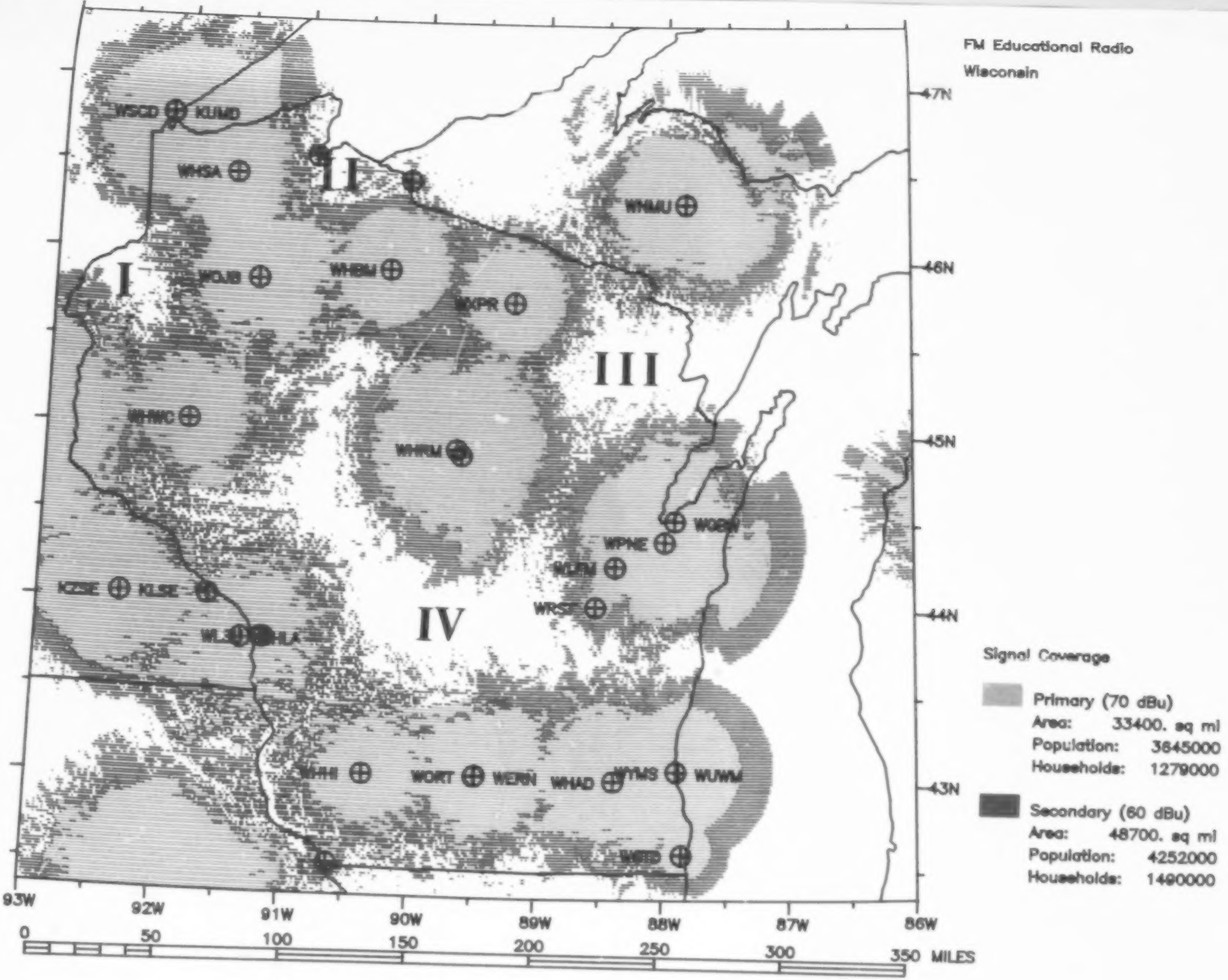
The slender "white region" between the Milwaukee area contours and those of the Oshkosh/Appleton area will be reduced when the Board replaces the antenna of WHAD-FM (Delafield).

Directly south of the contours of WHRM-FM (Wausau), the Board may place an FM translator or major satellite repeater station in Adams, which is the site of a Board-operated TV translator. The Board may consider similar action in the communities of Coloma and Reedsburg, depending on the economics of the situation. All these are long-range plans.

To the southwest of the Wausau station contours, the Board -- again in the long term -- may install either an FM translator or satellite repeater in the community of Neillsville. This will depend on the performance of the other contour-expansion initiatives underway.

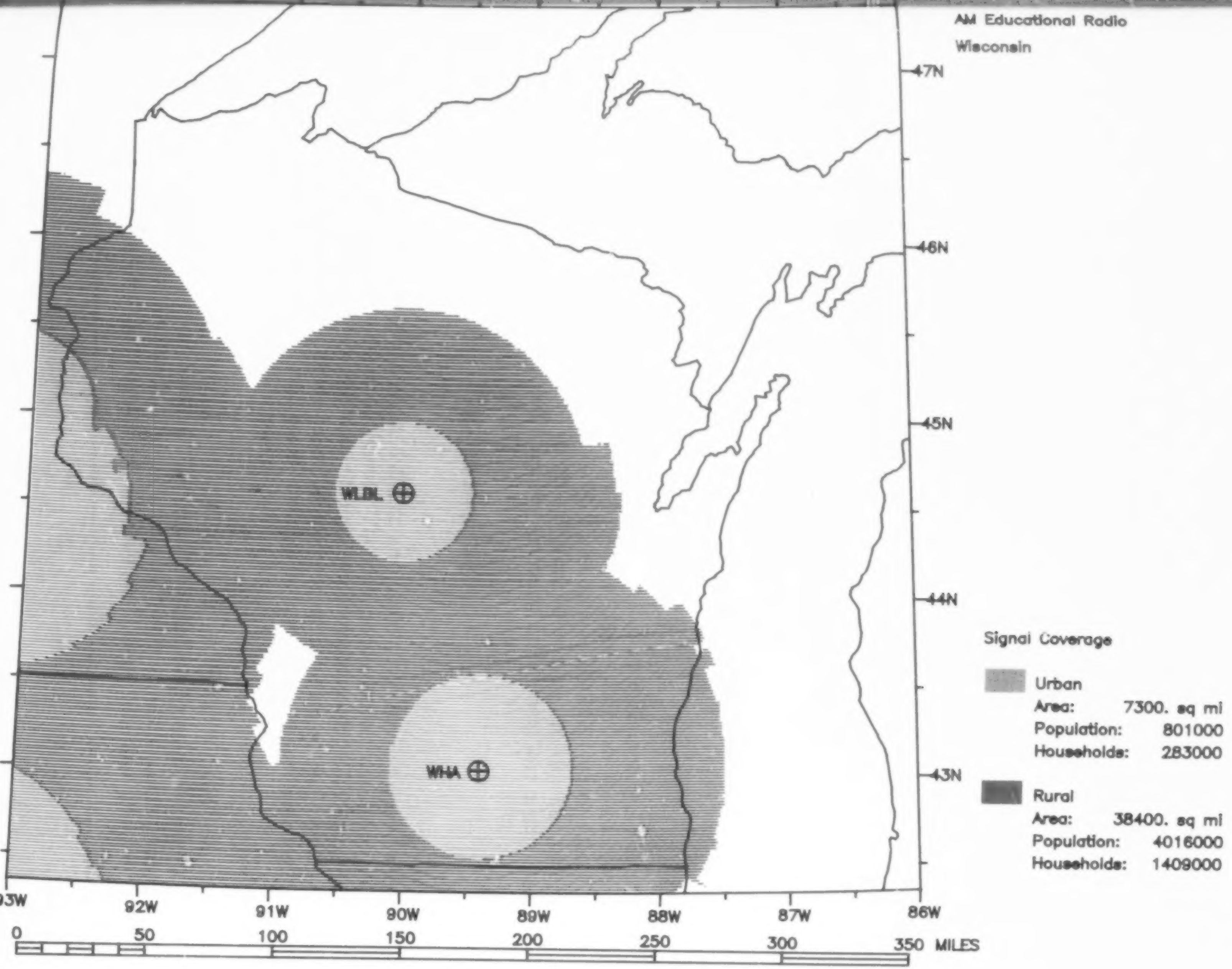
In Eau Claire, which is due west of the Wausau signal and immediately to the east of the Menomonie signal, the Board hopes to construct a Class A FM station. This plan is already in the proposed Board budget before the State Legislature.

FM Educational Radio
Wisconsin


WSCD
KUMD
WHSA
II
WNMU
I
WOJB
WHBM
WXPR
III
WHWC
WHRM
WPNE
WLFM
WRST
KZSE
KLSE
IV
WHHI
WORT
WERN
WHAD
WYMS
WUWM
47N
46N
45N
44N
43N
93W
92W
91W
90W
89W
88W
87W
86W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Primary (70 dBu)
Area: 33400. sq mi
Population: 3645000
Households: 1279000
Secondary (60 dBu)
Area: 48700. sq mi
Population: 4252000
Households: 1490000

AM Educational Radio

Wisconsin


47N
46N
45N
44N
43N
WLBL
WHA
93W
92W
91W
90W
89W
88W
87W
86W
0
50
100
150
200
250
300
350 MILES
Signal Coverage
Urban
Area: 7300. sq mi
Population: 801000
Households: 283000
Rural
Area: 38400. sq mi
Population: 4016000
Households: 1409000

WYOMING

Basic Statistics

Total State Population:	470,000
Total Population Receiving Public Radio Signal:	223,000 (47%)
Total Population in Uncovered Areas:	247,000

Public Radio Stations in State

Community	Call Letters
Laramie	KUWR-FM
Riverton	KCWC-FM

General Comments

Like most of the Rocky Mountain states, Wyoming has a widely dispersed, low-density population and a limited number of large metropolitan areas. The only in-state public radio service is supplied by the University of Wyoming (KUWR-FM) to the Laramie-Cheyenne area and by KCWC-FM in the central Wind River area. A Montana station, KEMC-FM, Billings, provides extensive translator service to the northern and central areas of the state.

Uncovered Areas

Region I

This area includes Sweetwater, Lincoln, Sublette and Uinta Counties and the southern section of the Bridger-Teton National Forest. The only population centers in the area are Rock Springs (population 19,458) and Green River (population 12,807). The other communities in the area have fewer than 1,000 people each. Because this area is so sparsely populated, complete public radio coverage to the entire region may not be feasible. Perhaps 60,000 to 80,000 unserved people live in this region.

Region II

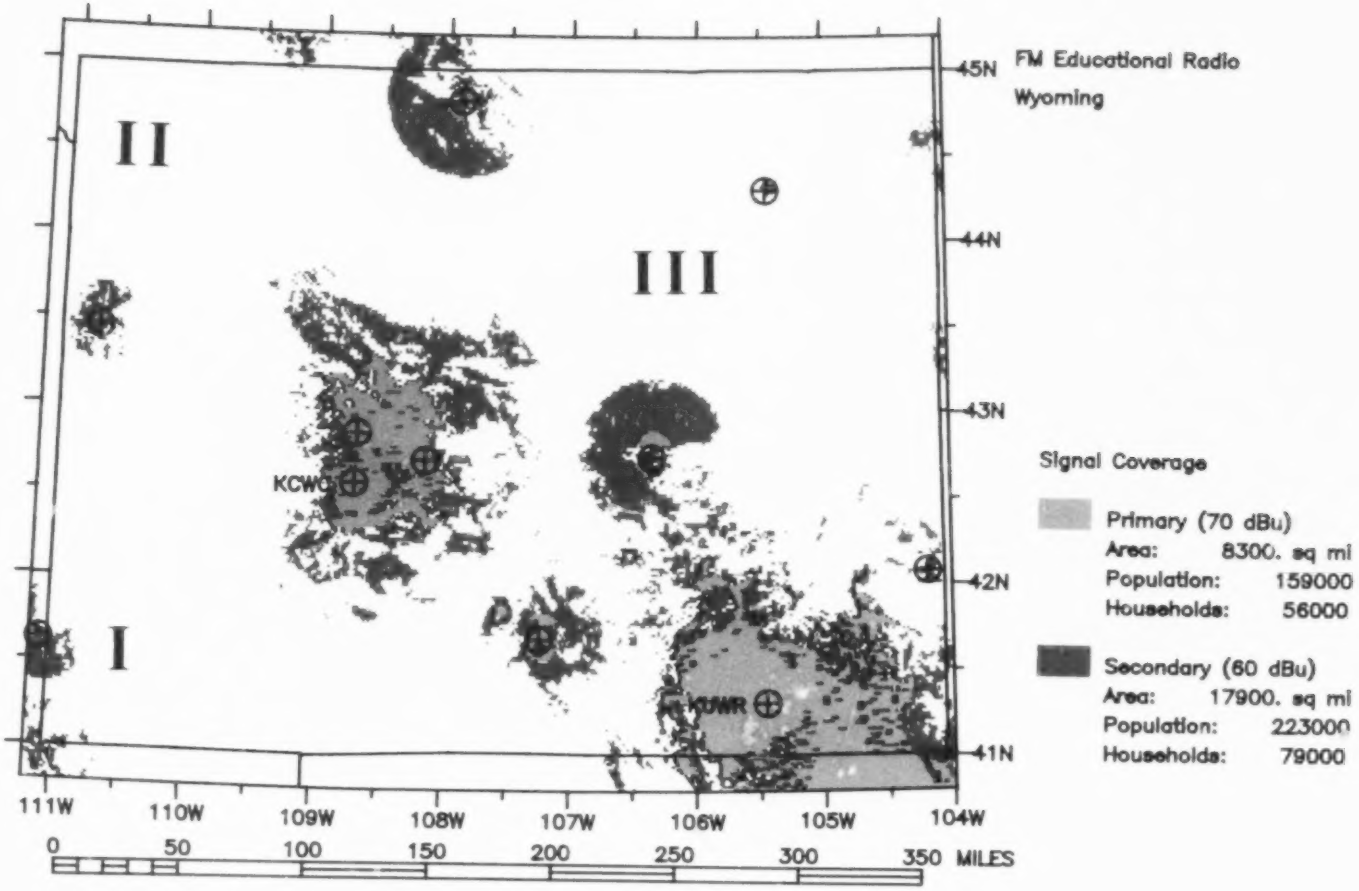
This area includes Yellowstone National Park and the Shoshone National Forest. The area is thus very sparsely populated. Cody, Thermopolis, Riverton, and Jackson presently receive a translated public radio signal from KEMC-FM, Billings, Montana.

Region III

As was the case with the other two unserved regions, Region III, the vast northeast corner of Wyoming, has a low population density. Its communities tend to be relatively small. In addition to the coverage depicted on the accompanying map, Sheridan is served by an FM translator rebroadcasting the signal of KEMC-FM.

Because of the widely dispersed population centers, translators may be the best technology for further extension. However, the economic feasibility will require study.

We have estimated that just under half of Wyoming's unserved population resides in this region.


FM Educational Radio
Wyoming
Signal Coverage
Primary (70 dBu)
Area: 8300. sq mi
Population: 159000
Households: 56000
Secondary (60 dBu)
Area: 17900. sq mi
Population: 223000
Households: 79000
I
II
III
KCWC
KUWR
45N
44N
43N
42N
41N
111W
110W
109W
108W
107W
106W
105W
104W
0
50
100
150
200
250
300
350 MILES

Chapter III

Conclusions

CONCLUSIONS

Approximately 94 percent of the U.S. population is able to receive at least one over-the-air public television signal. About 86 percent receives at least one public radio service.

All major markets receive at least one reliable public television signal, either from over the air or from cable television. Generally speaking, then, only small cities or rural areas remain without access to a reliable public television signal, which we have defined as a signal with Grade B strength. The percentage of the population not reached by public television would diminish if we considered people who receive signals direct from communications satellite via home dish antennas, who pick up distant public television signals with elaborate home antenna mechanisms, or who subscribe to cable television systems offering public television.

Only about 13 major markets remain unserved by public radio, the way the term was defined for this study. Four of these markets, however, already receive or will shortly receive national programming either from stations not yet constructed or from stations that were not included in the study.

The expansion of public television to the presently unserved areas may be accomplished without the construction of any more full-service, "stand-alone" stations.

We do not wish to imply that a given community that is willing to support such a station should not have one. Our point is, rather, that public television signal expansion will most likely take place almost entirely on the basis of the extension of the signals of already-existing stations; i.e., by major satellite repeater stations and translators.

The expansion of public radio, on the other hand, may involve some stations with local origination capabilities, although most of the unserved regions will receive public radio from repeater stations or translators.

The most likely candidate-communities for new public radio stations with program production capabilities are those that are major markets or that contain an established organization -- e.g., an academic institution or an Indian tribal government -- willing to act as licensee.

Some very remote areas are not likely to receive public broadcasting signals in the foreseeable future.

Primarily, this will be due to the inability of local entities to raise the money necessary to construct facilities to extend signals or to sustain operations.

One measure of the difficulties in extending service is the percentage of PTFP funds awarded over the past two years for this purpose. Signal extension projects are assigned PTFP's highest priority. Thus, at least theoretically, all PTFP funds could be made available to assist these projects. However, in FY 1987 only 30.1 percent of award monies were granted for extension projects and in FY 1988 13.7 percent were. This is one indicator of the trouble that local groups or stations are having in finding the resources for signal extension, even to relatively accessible locations.

In certain states, organizations that have assumed or been assigned responsibility for extending public radio or television signals statewide have played an invaluable role in covering virtually all residents of the state.

Innovative uses of telecommunications technologies present opportunities to extend public broadcasting signals with a local origination capability in a cost-effective way to communities in remote areas.

We have in mind here such recent innovations as, in radio, the Rocky Mountain Alternative Station and, in television, the kind of satellite-low power TV service presently offered by Rural Television System, Inc.

Appendices

Appendix A

Technical Methodology

The Institute for Telecommunication Sciences (ITS), the research arm of NTIA located in Boulder, Colorado, developed the technical data which form the basis of this coverage study. The coverage maps and the listings for AM and FM radio stations, FM radio translators, television stations and television translators were developed with computer techniques and programs devised by ITS. With Public Telecommunications Facilities Program (PTFP) staff input, these were revised many times. The final maps and station listings were a cooperative effort between the ITS and PTFP staffs.

Coverage Maps

The coverage maps of this study are based on the calculation of signals from all of the applicable transmitters to receiving points spaced at 1 minute intervals throughout the entire United States. The received signal level at each of these grid points is dependent upon the transmitter power radiated towards the receiver, and the radio path loss along the path to the receiving point. The transmitter power radiated is determined from the data contained in the FCC engineering data bases. The calculation of the radio propagation path loss for FM and TV (except for much of Alaska) was done using an Integrated Terrain radio propagation Model (ITM) that has been well documented to be the best method available for calculating the performance of broadcast signals. The ITM takes into account the intervening terrain around each broadcast antenna as well as all of the other system technical parameters.

The number of people or households in each state that receives an adequate signal was determined by adding up the estimated population or households in each 1 minute cell within the state when the signal level reached or exceeded a “coverage” threshold. A cell is the area created by the 1 minute longitude and 1 minute latitude grid.

AM signal characteristics are unique and thus present special problems. When an AM signal is transmitted, some of the transmitted energy travels along the ground (called a groundwave) and some goes toward the ionosphere. If the energy is reflected from the ionosphere, the signal at the receiver is called the “skywave” signal. This region of the radio spectrum allows both a groundwave signal and a skywave signal to be received at night, and only groundwave signals during the daytime. Because of this phenomenon, many more AM broadcast stations are on the air during the daytime than at night. Certain AM broadcast stations are allowed to transmit day and night; they are afforded interference-free operation from daytime-only stations broadcasting on the same frequencies. In other cases, the nighttime antenna patterns of some stations are different from their daytime patterns in order to mitigate interference effects with other AM broadcast stations. A problem results with nighttime signals; because the ionosphere reflects the signal to the earth and the reflection layer is continually moving, the nighttime skywave signal fades in and out at the AM broadcast receiver. For this reason, signal coverage from distant AM broadcast stations is not reliable at night.

In the case of the AM coverage, therefore, only daytime ground-wave coverage were calculated.

Description And Use Of Data Bases

Data bases from different sources were used in the ITS computer program that produced the maps and population statistics included in this coverage study. (1) Population calculations were based on 1980 Census Data; (2) transmitter and antenna characteristics were supplied by the FCC; (3) terrain profiles were constructed from topographical data from the Defense Mapping Agency and the U.S. Geological Survey; (4) ground conductivity values used in the AM broadcasting analysis were provided by the International Frequency Registration Board.

Population Data Base

The demographic density computer files were developed from the 1980 Census Data. The census data are stored as density of households, and density of population on 1/8 degree intervals throughout the United States. In the analysis for this report, the states were divided into cells of the size 1 minute in latitude by 1 minute in longitude. The signal from each educational transmitter was calculated to each of the cells. If the primary signal threshold (e.g. Grade A for television) was exceeded, the population density and household density for the cell's location were determined statistically. The two densities were then converted to number of people and households by multiplying densities times the area (1 square minute), and then adding these to the primary signal statewide population and households counts. Since the primary signal threshold is higher than that of the secondary signal (e.g. Grade B for television), the number of people and households receiving signals above the secondary signal threshold is inclusive of those shown receiving signal above the primary signal threshold. The estimated populations and households for each state were adjusted by a state correction factor, and rounded to the nearest thousand and displayed on the maps for each state.

FCC Broadcast Media Data Base

The FCC maintains machine-readable engineering data bases that contain most of the transmitter call signs, principal cities, locations (by latitude and longitude), and effective radiated powers for all broadcast stations. These data bases also include antenna characteristics for TV and AM stations. Many of the translator records for both TV and FM have some missing data that are required to calculate coverage of the station. In the case of FM translators, missing power is replaced by the average power of the translators that were included in this study that did have powers listed. In cases where the height of the antenna was not included, the PTFP staff called the appropriate stations or organizations and determined as much of the missing data as possible. This then required modification to the transmitter data base for these calculations.

Terrain Data Base

The topographic data file used in the analysis was developed from data obtained from the Defense Mapping Agency and the U.S. Geological Survey. In constructing a terrain profile from the transmitter location to the receiver or coverage cell location, elevation data at every kilometer along the path are calculated. Although some differences between the constructed path and the actual exist, the error to predicted broadcast coverage is minor.

The ITM propagation prediction program using the terrain data base and the broadcast media engineering station data bases has resulted in calculation of public broadcasting station national coverage that is the most accurate ever completed in a study of this type.

Ground Conductivity Data Base

The AM broadcast analysis uses ground conductivity values along the path from the transmitter to estimate AM broadcast band groundwave signal levels. The data base, in a digitized form, is available from the International Frequency Registration Board.

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Appendix B

Comparative Equipment Costs For Extension Of Public Radio And Television Signals

Below are estimated equipment costs for the types of facilities most likely to be chosen to extend public television or public radio service. As a basis for our facilities models, we have developed a hypothetical unserved area: a widely dispersed rural population totaling approximately 70,000 persons. The area is situated about 100 miles from the nearest public broadcast station. The assumption is that no tower space is available.

Many factors pertinent to the activation of repeater stations were not considered in the development of these models; e.g., frequency or channel availability, the cost of applying for a construction permit, local zoning requirements, the possible need for an electrical power installation, the costs associated with the purchase or lease of land, and operational expenses.

The estimates below, then, primarily reflect hardware costs. To provide a somewhat more realistic assessment of actual activation costs, however, a few major non-hardware expenses have also been identified.

High Power UHF Satellite Television Transmitter Model

The cost estimates below pertain to a high-power UHF satellite repeater television station. A satellite repeater is a full-power station which generally does little more than retransmit the signal of its parent station. In the model below, the signal from the originating station is transported to the repeater along a three-link microwave path.

Typically, a full-power (60 kw) repeater's signal, if it is of a sufficiently high quality, will cover the population within a 60-80 mile radius of the transmitter.

Quantity	Description	Cost
1	120 kw UHF television transmitter	$950,000
1	Television broadcast antenna	250,000
1 lot	Transmission line	200,000
1 lot	Microwave interconnect with backup $70,000 each times three hops	210,000
1 lot	Remote control system and telemetry	35,000
1 lot	Tower and installation	635,000
1 lot	Monitoring	90,000
1 lot	Miscellaneous installation materials	25,000
1 lot	Transmitter installation cost	55,000
	Total installed UHF satellite transmitter cost	$2,450,000
	Yearly power costs assuming typical klystrons and typical kilowatt hour costs	$ 120,000

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Television Translator Model

Typical television translator costs are estimated below. The model assumes that the translator receives the signal from its host facility off-air.

Under most circumstances, television translators will provide a reliable signal to the population within a five- to ten-mile radius of the translator. Translators are often constructed in chains, with one transmitting a signal to the next.

(For a more detailed discussion of translators, please see Appendix C.)

Quantity	Description	Cost
1	100 w TV low power translator	$ 9,500
1	Antenna, line, receive antenna, etc.	10,000
1	Tower with installation	10,000
1 lot	Installation materials, misc gear	10,000
	Total installed TV translator cost	$39,500

C-Band Satellite Transmission Model

The satellite earth station transmission system discussed immediately below would disseminate television signals to "back yard" satellite receive dish antennas. The cost would be borne by the consumer and would vary from $1,000 and $2,000. In this model, the signal would be available not only in our hypothetical geographic reception area, but also throughout most of the rest of the country.

Quantity	Description	Cost
1	C-Band uplink system installed	$275,000
1	Microwave to dish site with telemetry return	85,000
	Total installed cost of C-band satellite	$360,000
	Yearly transponder lease cost assuming transmission 24 hours per day	$1,900,000

FM Radio Satellite/Repeater Transmitter System With Translators Model

The cost-estimate model below reflects an FM radio satellite repeater station, connected to its originating stations by a three-link microwave system. A repeater station's signal is usually rebroadcast on a frequency different from that of the originating station.

The population within a 15-58 mile radius of the repeater's transmitter should receive a signal at the 60 dBu level of strength.

Quantity	Description	Cost
1	35 kw transmitter	$85,000
1	Circularly polarized transmit antenna	25,000
1	1000' tower including installation	415,000
1 lot	Microwave interconnect with backup $27,000 each times three hops	81,000
1	Remote control system with telemetry return to control point	20,000
1 lot	Monitoring equipment	10,000
1 lot	Transmitter installation materials	5,000
1 lot	Transmission line	25,000
1 lot	Transmitter installation w/proof	8,000
	Total installed satellite transmitter cost	$674,000
	Yearly power costs assuming typical kilowatt per hour costs	$ 18,000

FM Translator Model

The FM translator in the model below would receive its signal over the air from another radio facility, which could be an originating station, a repeater station, or a translator. The translator in the model would then rebroadcast the signal to an area within a 5- to 10-mile radius; the exact coverage area would depend on the translator's system design.

Quantity	Description	Cost
1	FM low-power translator	$ 8,500
1	4 bay CP antenna, line, receive antenna, etc.	10,000
1	Tower with installation	10,000
1 lot	Installation materials, misc. gear	10,000
	Total FM translator cost	$38,500

Appendix C

Public Television And Public Radio Translators

General Comments

Translators may be used to extend broadcast signals beyond the Grade B, or secondary, signal contours of main origination stations. Translators represent an important vehicle for extending public broadcasting. In some parts of the country, they have provided the only consistent public broadcasting services.

Interconnection between a translator and the main station is normally over the air. The translator rebroadcasts the main station's signal, usually on another channel. Translators are low-power facilities. Radio translators may broadcast with a power at either 1 or 10 watts; by comparison, a full-power FM class C station is allowed to transmit with 100,000 watts of effective radiated power. Television translators may broadcast with a power between 1 and 1000 watts; on the other hand, a full-power UHF TV station is allowed up to 5,000,000 watts of effective radiated power.

Translators are often utilized in mountainous or hilly regions. In such areas, the population clusters are frequently located where the reception from the main origination station is shadowed or nonexistent.

Translators are also found in small, rural communities located a great distance from a main origination station. Translators enable the residents of these sparsely populated areas to receive significant public television and radio services without incurring the expense of a full-service station.

The FCC considers translators to be a secondary service. If, therefore, a conflict arises over the use of a channel or frequency between a translator and a proposed or existing station, the translator must yield the disputed channel or frequency.

Television Translators

(An asterisk indicates that the available data did not allow the translator to be plotted on this study's signal contour maps.)

K02JI	ANGOON	AK
K05FI	DELTA JUNCTION	AK
K05FW	GIRDWOOD	AK
K05HI	NENANA	AK
K06JX	MANLEY HOT SPRINGS	AK
K06JZ	MENDENHALL VALLEY	AK
K07ND	HEALY	AK
K07PF	HOMER	AK
* K08IW	UNALASKA	AK
K08KY	SITKA	AK
K09OQ	WRANGELL	AK
K09OU	PETERSBURG	AK
K09OX	KETCHIKAN	AK
K10LS	LEMON, ETC	AK
K12LA	KENAI, ETC	AK
K12NR	KAKE	AK
K21AM	NINILCHIK, ETC	AK
K47AG	TALKEETNA	AK
K48AC	KASILOF	AK
K48AC	KASILOF	AK
K49AU	SUTTON	AK
K67AY	BIRDPOINT	AK
W58AJ	JACKSON	AL
W70AN	HAMILTON	AL
W72AH	WINFIELD	AL
W74AL	GUIN	AL
K13MV	EUDORA	AR
K02HR	BULLHEAD CITY	AZ
K04NB	GANADO	AZ
* K05GW	GANADO	AZ
K06HH	CHINLE	AZ
* K07PH	LECHEE/WANSHIP	AZ
K11MI	CAMP VERDE	AZ
K22BX	SHOW LOW	AZ
K27AT	TUCSON	AZ
K42AC	COTTONWOOD, ETC	AZ
K51AG	BIG PARK VALLEY, ETC	AZ
K51AV	CHINLE	AZ
K53AQ	EL PASO GAS CO	AZ
K55DB	PRESCOTT, ETC	AZ
* K60AT	SAWMILL	AZ
K61AX	WELLTON/MOHAWK	AZ
K63BG	WELLTON/MOHAWK	AZ
K64AP	ASH FORK	AZ
K64BN	LAKE HAVASU CITY	AZ
K65CD	BAGDAD	AZ
K65CM	DUNCAN, ETC	AZ
* K66AO	STEAMBOAT CAMYON	AZ
K66BS	FLAGSTAFF	AZ
K67AB	GLOBE/MIAMI	AZ
K68AK	KINGMAN	AZ
K71BQ	NORTH TUCSON	AZ
K02EE	WEAVERVILLE, ETC	CA
K02HC	ETNA, FORT JONES	CA
K03DR	YOSEMITE	CA
* K05CA	HAYFORK	CA
K05CR	HAYFORK	CA
* K05HH	FURNACE CREEK/VALLEY	CA
K06CV	JUNE LAKE	CA
K06ET	BIG BEND, ETC	CA
K07IX	HAPPY CAMP	CA
K07RW	TECOPY/SHESHONE	CA
* K09MS	HOOPA	CA
K09PM	COVELA	CA
K13IT	CANBY, ETC	CA
K13IV	TULE LAKE	CA
K13JS	BIG SUR	CA
K13RZ	LITCHFIELD	CA
K25AC	SANTA CRUZ/WATSONVILLE	CA
* K44AI	INDEPENDENCE	CA
K47CC	VICTORVILLE	CA
* K52BR	GILROY/SAN MARTIN	CA
K55AB	CHINA LAKE	CA
K55AP	SANTA BARBARA, ETC	CA
K56AA	SALINAS	CA
K59AC	GONZALES	CA
K59AL	TORREY PINES, ETC	CA
* K60AR	LONG VALLEY	CA
K61AI	SANTA BARBARA	CA
K63DP	CHESTER	CA
K65CC	SUSANVILLE, ETC	CA
K67AM	LA JOLLA	CA
K69CO	CALVERT PEAK	CA
K69CU	BOONEVILLE-PHILO	CA
K69DF	UKIH	CA
K69DI	POTTER VALLEY	CA
K70EL	YREKA, SHASTA VALLEY	CA
K74CS	SAN ARDO, ETC	CA
* K77BB	BLYTHE	CA
K82BC	MORGAN HILL	CA
K83BT	ALTURAS	CA
K02KI	SAN LUIS	CO
K02KJ	DEL NORTE	CO
K02NN	MT. CARMEL	CO
* K03AW	GLENWOOD	CO
K03CD	LEADVILLE	CO
K03CF	BLUE RIVER, ETC	CO
K03FR	LA VETA	CO
K03FS	NEW CASTLE, ETC	CO
K04HO	BASALT	CO
K04KB	AGUILAR	CO
K04KF	ROAN CREEK	CO
K06GW	DIVIDE CREEK, ETC	CO
K07PA	MANITOU SPRINGS	CO
K07QB	PICEANCE CREEK	CO
K07QE	STALEY, ETC	CO
* K07RR	REDSTONE	CO
K07UN	BACA COUNTY	CO
K10LN	EAST ELK CREEK	CO
K11PX	GATEWAY	CO
K11QJ	BOULDER	CO
K12MH	SUTANK, ETC	CO
* K12MQ	ASPEN	CO
K13PW	ESTES PARK, ETC	CO
K13QU	BUFORD, ETC	CO
K13QZ	GRAND VALLEY	CO
K20AE	AKRON, ETC	CO
K21AB	COLORADO SPRINGS,ETC	CO
K21AD	PEETZ, ETC	CO
K29AC	STERLING, ETC	CO
K30AD	ANTON, ETC	CO
K32AC	WHITE RIVER, ETC	CO
K34BZ	MONTROSE	CO
K36AC	YUMA	CO
K39AC	JULESBURG	CO

Television Translators (continued)

K40BV	WAUNITA HOT SPRINGS	CO
K41AE	COLBRAN	CO
• K49AK	HUGO	CO
K49AX	NUCLA, ETC.	CO
K50AE	WILSON CREEK, ETC.	CO
K51CL	DEORA	CO
K52AI	IDALIA	CO
K52BC	FRUITA	CO
K53AJ	HAXTUN	CO
K53AR	SALIDA, ETC.	CO
• K53BQ	COLORADO SPRINGS	CO
K55AX	BETHUNE, BURLINGTON	CO
K55CL	ALAMOSA, ETC.	CO
K56AG	EADS	CO
K57AA	ESTES PARK	CO
K57CY	COTOPAXI, ETC.	CO
K58AQ	STEAMBOAT SPRINGS	CO
K58BV	DELTA	CO
K59AH	LAMAR	CO
K59BU	DURANGO	CO
K59BY	BLUE MOUNTAIN, ETC.	CO
K59CL	COALDALE	CO
K60BM	WALDEN	CO
K60CF	BOULDER	CO
• K60KJ	CRAIG	CO
K61BO	BAYFIELD & IGNACIO	CO
K61BP	MARVINE CREEK, ETC.	CO
K61BR	OURAY, ETC.	CO
K62AP	PAGOSA SPRINGS	CO
• K62BO	CARBONDALE	CO
K62BU	LAKE GEORGE, ETC.	CO
K62CV	BOULDER	CO
K65AO	FLAGLER-SEIBERT	CO
K66BQ	RULISON, ETC.	CO
K67CJ	FRUITA	CO
K68AQ	CHEYENNE WELLS	CO
K68BI	SUNETHA	CO
K68BS	CRAIG	CO
K68BY	COLORADO SPRINGS	CO
K69AN	LAS ANIMAS	CO
K69CW	RURAL JACKSON COUNTY	CO
K69CX	TRINIDAD, VALDEZ, ETC	CO
W12BH	WATERBURY	CT
W04BJ	YOUNG HARRIS	GA
W22AC	HARTWELL & ROYSTON	GA
W27AA	DRAKETOWN	GA
W35AA	LA FAYETTE	GA
W48AB	COLUMBUS	GA
W49AD	CARROLLTON	GA
W50AB	HIAWASSEE	GA
W51AB	FLINTSTONE, ETC.	GA
W52AA	CARNESVILLE	GA
W60AE	ELBERTON	GA
W65AD	CEDARTOWN	GA
W68AF	TOCCOA	GA
K04FE	HILO	HI
K56BD	KILAUEA MILITARY CAMP	HI
K62AQ	KILAUEA	HI
K63AA	WAIALUA	HI
K63AI	KAUMAKANI, ETC.	HI
K63AZ	ANAHOLA, ETC.	HI
K63BB	NAALEHU, ETC.	HI
K63DT	WAIMEA	HI
K66AY	WAIPAKE	HI
K67AV	LIHUE, ETC.	HI
K67BA	HAKALAU	HI
K68BE	HANALEI, ETC.	HI
K69CF	HAWAIAN OCEANV WEST	HI

K14AF	DECORAH	IA
K25AA	ROCK RAPIDS, ETC.	IA
K33AA	OTTUMWA	IA
K33AB	SIBLEY, ETC.	IA
K38AB	FORT MADISON, ETC.	IA
K41AD	LANSING	IA
K44AB	KEOKUK, ETC.	IA
K54AF	KEOSAUQUA, ETC.	IA
• K83AU	SPENCER	IA
K02LR	MAY, ETC.	ID
K05FG	MCCALL, ETC.	ID
K05GL	PRIEST LAKE	ID
K05GO	COUNCIL	ID
K05GQ	KOOSKIA & STITES	ID
K08JO	FERNWOOD & SANTA	ID
K09LO	CASCADE	ID
K09OZ	FAIRFIELD	ID
K11KO	KAMIAH	ID
K11PB	CAMBRIDGE, ETC.	ID
• K12CK	SODA SPRINGS	ID
K12LS	CHALLIS & ELLIS	ID
K13LR	FILER, ETC.	ID
K13QE	DRIGGS, ETC.	ID
K13QF	GLENNS FERRY	ID
K13QH	IRWIN & SWAN VALLEY	ID
K15CH	LEWISTON	ID
K26AD	COEUR D'ALENE, ETC.	ID
K57BN	MONTPELIER	ID
K57CI	SALMON	ID
K57CM	PRIEST LAKE	ID
K59BA	COTTONWOOD/GRANGEVILLE	ID
K59BV	LAVA HOT SPRINGS	ID
K59BW	BONNERS FERRY	ID
K62BD	MALAD CITY	ID
K64BD	PRIEST RIVER-SANDPOI	ID
K64BR	LEWISTON	ID
K64CM	JULIAETTA	ID
K65AQ	HAGERMAN	ID
K67BX	KELLOGG	ID
• K68AB	BONNERS FERRY	ID
K68BC	LEWISTON	ID
K69CK	CROUCH, ETC.	ID
K69CL	GEORGETOWN	ID
K69CN	ST. MARIES, ETC.	ID
K69DC	ALBION, ETC.	ID
K11NS	NATOMA	KS
K13QO	ATWOOD	KS
K30AL	IOLA	KS
K64BS	CONCORDIA	KS
K66CD	PHILLIPSBURG	KS
K69DB	HOXIE	KS
W08BL	PINEVILLE	KY
W09AX	COWAN CREEK, ETC.	KY
W10AR	LOUISA	KY
W12AY	BARBOURVILLE, ETC.	KY
W55AJ	HAWESVILLE	KY
W55AL	THOMPKINSVILLE	KY
W56AM	FALMOUTH	KY
W56AT	AUGUSTA	KY
W64AV	HOPKINSVILLE	KY
W66AH	WHITESBURG	KY
W67AN	LETCHER	KY
W03AM	HARRISON, ETC.	ME
W04AY	ST. FRANCIS	ME
W04BS	BETHEL, ETC.	ME
W14AB	SKOWHEGAN, ETC.	ME
W46AC	TRAVERSE CITY, ETC.	MI

Television Translators (continued)

W46AH	PORT HURON	MI
W69AV	LELAND, ETC.	MI
K30AF	ALEXANDRIA	MN
K46AA	ST. JAMES AND MOUNTAIN	MN
K53BH	GRAND PORTAGE	MN
K57AE	OLIVIA	MN
K67AN	GRANITE FALLS	MN
K67CT	GRAND MARAIS	MN
W21AN	THIEF RIVER FALLS	MN
W64AC	REDWOOD FALLS	MN
W45AA	COLUMBIA	MS
K05BL	LAME DEER	MT
K06KX	ROUNDUP	MT
K07CH	PLAINS & PARADISE	MT
K07EJ	TOWNSEND	MT
K10JK	HINSDALE	MT
K10LH	WEST PLEASURE	MT
K11MF	LIBBY	MT
K14AR	GLASGOW	MT
K17BT	LIVINGSTON	MT
K21AN	DARBY	MT
K21CB	FORSYTH	MT
K25CL	PABLO/RONAN	MT
K28CF	ST. IGNATIUS	MT
K29AA	KALISPELL	MT
K30BC	WEST YELLOWSTONE	MT
K57CX	WHITE SULPHUR SPRING	MT
K67EC	PINESDALE	MT
K68AS	LIBBY	MT
K73BN	FORT PECK	MT
W05AU	BAT CAVE, ETC.	NC
W23AF	CULLOWHEE	NC
W27AB	CANTON, ETC.	NC
W27AO	BOONE	NC
W31AN	MURPHY	NC
W35AD	SPARTA	NC
W42AT	HAYESVILLE	NC
W46AG	BOONE	NC
W56AG	FRANKLIN, ETC.	NC
W56AN	TRYON, ETC.	NC
W59AD	ANDREWS, ETC.	NC
W59AK	SPRUCE PINE	NC
W59AR	BREVARD, ETC.	NC
W62BA	HAYESVILLE, ETC.	NC
W62BB	HIGHLANDS	NC
W65AT	MARION	NC
W67AQ	BURNSVILLE	NC
W67AV	BRYSON CITY, ETC.	NC
K02FO	VALLEY CITY	ND
K07NE	LISBON	ND
K11QD	HAZEN	ND
K06JC	CHADRON	NE
K06KR	CRAWFORD	NE
K10JW	VERDIGRE	NE
K12HQ	BENKELMAN	NE
K12KI	CULBERTSON	NE
K12KK	TRENTON	NE
K13KB	MCCOOK	NE
K13NU	STRATTON	NE
K23AA	BEATRICE	NE
K24AC	FALLS CITY	NE
K33AC	PAWNEE CITY	NE
K65AT	NELIGH	NE
K66AR	DECATUR	NE
K68AV	BLAIR	NE
K69BM	NIOBRARA	NE
K69BN	WAUNETA	NE
W49AT	CAPE MAYCOURT HOUSE	NJ
K02EU	ROY	NM
K02GB	QUEMADO	NM
K02JT	RAMAH	NM
K02KG	CLIFF, GILA	NM
K02KP	LORDSBURG	NM
K02KQ	MESCALERO APACHE IND	NM
K02KR	MESCALERO	NM
K11IZ	RODARTE	NM
K12LL	SILVER CITY	NM
K13UL	HILLSBORO	NM
K38AU	CROWNPOINT	NM
K43AI	FARMINGTON	NM
K48AW	SHIPROCK	NM
K53AW	GIBSON	NM
K53BA	TRES PIEDRAS	NM
K54BN	CAPULIN & DES MOINES	NM
• K58AG	NEW COMB	NM
K58AZ	NOLAN & WOOTON	NM
K59CN	TRUTH OR CONSEQUENCE	NM
K60AA	COLFAX	NM
K60DR	FARMINGTON, ETC.	NM
K61BA	INDIAN VILLAGE, ETC.	NM
K61EM	RUIDOSO	NM
K62BC	CARRIZOZO	NM
K63AX	EAGLE NEST, ETC.	NM
• K63BD	GALLUP	NM
K63BR	TUCUMCARI	NM
K63BU	GALLINA	NM
K65BQ	LAS VEGAS	NM
K65BS	HATCH, ETC.	NM
K65CB	FORREST, ETC.	NM
K67AX	ALAMOGORDO	NM
K67CR	GRANTS, ETC.	NM
K68BO	WAGON MOUND	NM
K69CG	ROY, ETC.	NM
K69CH	CHAMA	NM
K69CI	SHERIDAN	NM
K69CJ	TAOS	NM
K69CV	CARLSBAD	NM
K74BO	SANTA ROSA	NM
K74DJ	ZUNI	NM
K02FJ	OVERTON	NV
K02FM	GOODSPRINGS	NV
K02FN	MESQUITE	NV
• K06JP	N. PAHRUMP	NV
K07JC	INDIAN SPRINGS	NV
• K07OH	GARRISON, BAKER	NV
K13NQ	RUTH	NV
K13NR	ELY, ETC.	NV
K14AJ	INCLINE VILLAGE	NV
K14AL	ELY	NV
K14AO	ELKO	NV
K15AL	WINNEMUCCA, ETC.	NV
K15AN	CARSON CITY	NV
K17AH	TONOPAH	NV
K25AK	FALLON	NV
K45AL	CALIENTE'	NV
K45AO	PIOCHE	NV
K50AI	HAWTHORNE	NV
K53AE	PAHRUMP	NV
• K55AE	PANACA	NV
K55AO	PANACA	NV
K67AL	ELY	NV
W04AJ	SCHOHARIE, ETC.	NY
W04AS	GILBOA	NY

Television Translators (continued)

W04BD	GLENS FALLS	NY
W04BE	SALT SPRINGVILLE	NY
W04BG	MORRIS	NY
W07BF	SPROUT BROOK, ETC.	NY
W12AZ	HUNTER, ETC.	NY
W30AA	ELMIRA	NY
W46BA	JAMESTOWN	NY
W55AC	COHOCTON-AVOCA	NY
W55AD	GREENWOOD	NY
W56AD	KENNEDY	NY
W56AH	WOODHULL	NY
W56AI	HAMMONDSPORT	NY
W56AR	VAN ETTEN	NY
W56AU	WELLSVILLE & SCIO	NY
W56AV	RUSHFORD & HOUGHTON	NY
• W57AC	CANASERAGA	NY
W57AD	CAMERON	NY
W57AE	PRATTSBURG	NY
W57AF	BINGHAMTON, ETC.	NY
W58AD	ADDISON	NY
W58AE	ELMIRA	NY
W59AF	SPENCER	NY
W59AH	ALLENTOWN, ETC.	NY
W59AU	UTICA	NY
W60AC	FINDLEY LAKE	NY
W60AD	SAVONA	NY
W60AJ	CUBA	NY
W60AO	PORT HENRY	NY
W61AJ	ANDOVER	NY
W62AD	CLYMER	NY
W62AE	CHERRY CREEK, ETC.	NY
W62AG	TOWERVILLE	NY
W62AJ	WAVERLY	NY
W62AK	LINDLEY	NY
W62AL	MAINE	NY
W62AN	NEDROW, ETC.	NY
W62AQ	FILLMORE	NY
W62AS	FRIENDSHIP & BELMONT	NY
W62AV	OWEGO	NY
W62AX	BELDEN	NY
W63AG	EAST BINGHAMTON	NY
W64AF	SHERMAN	NY
W64AJ	WHITESVILLE	NY
W64AP	TIOGA CENTER, ETC.	NY
W65AJ	ANGELICA, ETC.	NY
W65AK	KATTELVILLE	NY
W65AN	BERKSHIRE, ETC.	NY
W66AD	CANISTEO, ETC.	NY
W66AE	HAWLEYTON	NY
W66AF	PINE CITY	NY
W66AG	WHITNEY POINT	NY
W66AO	HARPURSVILLE	NY
W67AA	SPRINGFIELD	NY
W67AD	DELHI	NY
W67AM	VESTAL	NY
W67AR	WILLSBORO	NY
W67AW	TICONDEROGA	NY
W67AY	WESTPORT	NY
W68AD	CORNING	NY
W68AJ	BOLIVAR & RICHBURG	NY
W69AF	TROUPSBURG	NY
W69AH	MONTOUR FALLS	NY
W69AI	ARKVILLE	NY
W69BP	STAMFORD	NY
W72AQ	GREAT VALLEY	NY
W73AR	DELEVAN, ETC.	NY
W75AQ	EDMESTON	NY
W76AF	JEFFERSON	NY
W76AM	OLEAN, ETC.	NY
W79AY	WORCESTER	NY
W80AK	SPRINGVILLE, ETC.	NY
W81AH	SOUTH KORTWRIGHT	NY

W81AI	MACHIS, ETC.	NY
W81AJ	CATTARALLGUS, ETC.	NY
W81AK	ELLICOTTVILLE, ETC.	NY
W81AM	MILFORD, ETC.	NY
W82AP	LIMESTONE, ETC.	NY
W83AL	ANDES	NY
W83AT	CHERRY VALLEY NY	
• W83AU	LAURENS	NY
K58AM	YOUNGSTOWN	OH
W17AA	CELINA	OH
W31AA	NEWARK	OH
• W47AA	MANSFIELD	OH
W47AB	MANSFIELD	OH
W55AH	CHAGRIN FALLS	OH
W58AG	GEORGETOWN	OH
W63AH	MAPLEWOOD AREA	OH
W64AK	CONNEAUT	OH
W65AH	LOUDONVILLE	OH
W66AK	GATES MILLS	OH
W67AL	EASTLAKE AREA	OH
W69AO	MILLERSBURG	OH
K15AA	HUGO	OK
K16AB	GUYMON	OK
K19AA	ALTUS	OK
K28AC	ARDMORE	OK
K30AE	ALVA	OK
K36AB	LAWTON	OK
K38AK	PONCA CITY	OK
K46AH	MEDFORD	OK
K46AI	DURANT	OK
K54BB	DUNCAN	OK
K55BV	BOISE CITY	OK
K56AY	BEAVER	OK
K56BQ	FREDERICK	OK
K58AX	BUFFALO	OK
K63BA	IDABEL	OK
K02JF	BUTTE FALLS	OR
K02JG	PROSPECT	OR
K02JJ	WILLIAMS	OR
• K04AY	SILVER LAKE	OR
K07RQ	JACKSONVILLE	OR
K08KW	RICHLAND	OR
K09OD	ONTARIO	OR
K13PE	SHADY COVE	OR
K13PF	PINEHURST	OR
K13PH	CAVE JUNCTION	OR
K13PI	RUCH/APPLEGATE	OR
K17AA	COOS BAY, ETC.	OR
K18AN	GRANTS PASS	OR
K19BK	LAKEVIEW	OR
K36BA	BURNS	OR
K55CM	GOLD BEACH	OR
K55DQ	GOLD HILL, ETC.	OR
K59BO	PENDLETON, ETC.	OR
K61BF	ENTERPRISE	OR
K61BT	MILTON-FREEWATER	OR
K61BU	PORT ORFORD	OR
K63BS	HEPPNER, ETC.	OR
K65CH	ARLINGTON	OR
K66AH	THE DALLES, ETC.	OR
K66AS	NEWPORT, ETC.	OR
K66BE	ELKTON	OR
K66BF	ROSEBURG	OR
K68AJ	HOOD RIVER, ETC.	OR
K68BA	PACIFIC CITY	OR
K68BF	EUGENE	OR
K68BG	GLIDE, ETC.	OR
K68CB	JOHN DAY	OR
K69AB	MILTON/FREEWATER	OR

Television Translators (continued)

K69AD	ENTERPRISE	OR
W25AQ	TOWANDA	PA
W48AQ	CLARKS SUMMIT, ETC.	PA
W56AQ	WAYMART	PA
W59AE	PINE GROVE	PA
W60AM	READING, ETC.	PA
W62AO	HAWLEY	PA
W62AU	YORK	PA
W63AB	MANSFIELD	PA
W64AE	UNIONDALE	PA
W65AA	CANTON	PA
W66AB	MESHOPPEN	PA
W72AT	TOWANDA	PA
W73AH	CHAMBERSBURG	PA
W77AI	WYALUSING	PA
W80AM	HONESDALE	PA
W62AB	WESTERLY	RI
K04GV	PHILIP	SD
K04GW	SPEARFISH	SD
K06HG	PINE RIDGE	SD
K07JD	ABERDEEN	SD
K09UN	MITCHELL	SD
K13PN	WASTA	SD
K23BR	CHAMBERLAIN	SD
K23BZ	SIOUX FALLS	SD
K55AV	PRINGLE	SD
K55BG	WAGNER	SD
K61AS	PICKSTOWN	SD
K64AL	EDGEMONT	SD
K24AD	WICHITA FALLS	TX
K29AD	CORSICANA	TX
K41AK	FAIRFIELD	TX
K55CQ	MIAMI	TX
K69FC	UVALDE	TX
K03CN	DUCHESNE	UT
K05CP	TOQUERVILLE	UT
• K06DH	SCIPIO,HOLDEN	UT
K06DR	SPRING GLEN, ETC.	UT
K06DY	ROOSEVELT, ETC.	UT
• K06IF	EVANSTON/BEAR RIVER	UT
K06IG	KOOSHAREM	UT
K06IM	ECHO/HENEFER	UT
K07DO	MANTI/EPHRAIM, ETC.	UT
K07ES	KANAB	UT
K07GQ	CEDAR CITY	UT
K07GY	BEAVER/ADAMSVILLE	UT
K07JV	CIRCLEVILLE	UT
K07JW	PANGUITCH	UT
K07JZ	ESCALANTE	UT
K07KM	HANKSVILLE	UT
K07LT	COALVILLE	UT
K07LU	PARK CITY	UT
• K07NS	HELPER	UT
K07OB	CANNONVILLE	UT
K07OQ	EAST PRICE	UT
K07OV	GREEN RIVER	UT
K07OX	MINING SITE	UT
K07OY	ORDERVILLE/GLENDALE	UT
K07PE	MAYFIELD	UT
K09LZ	MANILA, ETC.	UT
• K12FL	PAROWAN	UT
K12LC	WANSHIP	UT
K13DX	EUREKA, ETC.	UT
K13HF	VERNAL/BONANZA	UT
K13HH	ENTERPRISE	UT
K13SR	HILDALE, ETC. (AZ)	UT
K16BO	MILFORD, ETC.	UT
K18CG	BOULDER	UT
K21CI	WASHINGTON, ETC.	UT
• K32AH	BRIAN HEAD	UT
K32AL	MARYSVALE	UT
K34AN	MANTI, ETC.	UT
K36CB	RICHFIELD, ETC.	UT
K40AF	MONTICELLO, ETC.	UT
K40AH	TORREY	UT
K42AJ	RICHFIELD, ETC.	UT
K47AK	WASHINGTON, ETC.	UT
K49AO	RURAL JUAB, ETC.	UT
K49BO	COLUMBIA, ETC.	UT
K53BD	ST. GEORGE	UT
K55BO	RURAL GARFIELD, ETC.	UT
K55BS	RANDOLPH & WOODRUFF	UT
K55CS	HUNTSVILLE, ETC.	UT
K56AE	HEBER	UT
K56AZ	ANTIMONY	UT
• K56BA	MOUNT PLEASANT	UT
K56BP	HATCH	UT
K57AQ	ALTON, ETC.	UT
K57BE	WENDOVER	UT
K57CK	TABIONA & MYTON	UT
K60BU	ORANGEVILLE, ETC.	UT
K61AT	LOGAN	UT
K62BR	VIRGIN	UT
K63BF	LAKETOWN, ETC.	UT
K63BY	MILFORD, ETC.	UT
K64AM	FILLMORE	UT
K65AD	SUMMIT COUNTY	UT
K65AL	WAYNE COUNTY	UT
K66BK	SALINA/REDMOND	UT
• K67AP	NAVAHO MOUNTAIN	UT
K69AP	MORGAN, ETC.	UT
K69AR	OAKLEY/PEOA	UT
K69BG	LONG VALLEY	UT
K79AU	DELTA	UT
• K83BB	CARBON COUNTY	UT
K83BC	VIRGIN	UT
K83BD	MARYSVALE	UT
W39AK	ROCKFISH VALLEY	VA
W41AB	RUCKERSVILLE, ETC.	VA
W42AC	FRONT ROYAL, ETC.	VA
W42AV	FREDERICKSBURG	VA
W49AV	RUCHERSVILLE	VA
W67AB	SUGAR LOAF, ETC.	VA
W67AE	STUART, ETC.	VA
W69AK	BLAND	VA
W71AH	SOUTH BOSTON, ETC.	VA
W73AJ	SOUTH BOSTON, ETC.	VA
W73AS	OAK GROVE	VA
W74AP	GALAX	VA
W74AU	COBBS CREEK	VA
W75AI	LOVINGSTON	VA
W75AL	LURAY	VA
W75AP	OAK GROVE	VA
W76AE	RUSTBURG	VA
W76AG	CHARLOTTESVILLE,ETC.	VA
W76AN	COBBS CREEK	VA
W77AE	CHASE CITY, ETC.	VA
W78AG	RUSTBURG	VA
W79AT	CHASE CITY, ETC.	VA
W79AX	HEATHSVILLE	VA
W80AN	AMHERST	VA
W81AG	DANVILLE	VA
W81AL	HEATHSVILLE	VA
W74AO	MANCHESTER, ETC.	VT
W76AJ	WILMINGTON	VT
W79AV	POWNAL BENNGTON	VT

Television Translators (concluded)

K03FA	MIRRORAMOUNT	WA
K05HK	MOLSON	WA
K07SB	OROVILLE	WA
K13NK	OMAK, ETC.	WA
K18AD	EAST WENATCHEE, ETC.	WA
K40AE	CASHMERE	WA
K52AB	MOSES LAKE	WA
K56BK	BREWSTER & PATEROS	WA
K57AY	DRYDEN	WA
K57BZ	RIVERSIDE, ETC.	WA
K59BX	GRAYS RIVER, ETC.	WA
K60AE	SOAP LAKE, ETC.	WA
K61BI	NEAH BAY	WA
K64AB	ODESSA	WA
K66BT	PRESCOTT	WA
K67CH	MALOTT, ETC.	WA
K67CZ	ELLFORD	WA
K69BE	ELLENBURG	WA
K69BU	GRAYS RIVER	WA
K69BX	MANSON	WA
* K70EP	QUINCY	WA
K76CQ	PASCO	WA
W39AE	ARMSTRONG CREEK	WI
W39AF	WEBSTER	WI
W49AG	BLOOMINGTON	WI
W54AR	FENCE	WI
W55AO	TWNSHP OF WASHINGTON	WI
W55AP	RIVER FALLS	WI
W64AU	ADAMS	WI
W15AD	WARDENSVILLE	WV
W41AA	WHEELING	WV
W41AO	HAMPSHIRE, ETC.	WV
W44AA	MARTINSBURG	WV
W48AA	KEYSER	WV
W57AG	PARKERSBURG	WV
W60AB	HAMPSHIRE, ETC.	WV
W69AC	ROMNEY	WV
K02LG	SOUTH FORK, ETC.	WY
K02LH	UPPER CLARK'S	WY
K03GF	MANDERSON, ETC.	WY
K06JG	WHEATLAND	WY
K06KH	CASPER	WY
K06KS	SOUTH FORK, ETC.	WY
K07OI	GRANGER	WY
K07QA	CLARK	WY
K07RS	NORTH FORK	WY
K07RT	WOOD RIVER, ETC.	WY
K09OC	SARATOGA	WY
K11MN	JEFFREY CITY	WY
K11QL	SUNLIGHT BASIN, ETC.	WY
K14HH	SOUTH PARK	WY
K25AU	DUBOIS, ETC.	WY
K28CH	GILLETTE	WY
K49AI	CODY, ETC.	WY
K50BL	JACKSON	WY
K56AV	RAWLINS, ETC.	WY
K57AF	LARAMIE	WY
K63BO	MEETEETSE, ETC.	WY
W17AL	MATHIAS	WY

FM Radio Translators

(An asterisk indicates that the data available did not allow the translator to be plotted on this study's signal contour maps.)

K201AM	GUSTAVUS	AK
K201AO	SEWARD	AK
K202AO	SOLDOTNA, ETC.	AK
K203AP	AMBLER	AK
K203AW	EAGLE RIVER	AK
K204AS	SHUNGNAK	AK
K205BB	TALKEETNA	AK
K205BC	KOBUK	AK
K208BC	PALMER	AK
K210AS	EXCURSION INLET	AK
K211AT	MOUNT POINT, ETC.	AK
K211AU	THORN BAY, ETC.	AK
K211AV	HYDABURG	AK
K211AX	KLAWOCK	AK
K216AN	NENANA	AK
K216BG	UNALASKA, ETC.	AK
K219AD	CENTRAL, ETC.	AK
K219AQ	DELTA JUNCTION	AK
K219BA	PELICAN	AK
K220AL	GIRDWOOD	AK
K220AU	PORT LIONS	AK
K220BK	SKAGWAY	AK
K220BO	SCAMMON BAY	AK
K220BR	TENAKEE SPRINGS	AK
K220BT	HOONAH	AK
• K269DZ	NUIQSUT	AK
• K269EA	KAKTOVIK	AK
• K269EB	POINT LAY	AK
K206AH	DINNEHOTSO, ETC.	AZ
K208AA	COTTONWOOD	AZ
K208AB	FLAGSTAFF	AZ
K209AF	TUCSON	AZ
K209AG	SIERRA VISTA	AZ
K209AM	PAGE	AZ
K209AN	KINGMAN	AZ
K210AO	RED ROCK, ETC.	AZ
K211AA	PRESCOTT	AZ
K214AS	FLAGSTAFF	AZ
K215AV	PRESCOTT	AZ
K201AW	LANCASTERCA	
K202AK	CHESTER, ETC.	CA
K202AP	MCCLOUD, ETC.	CA
K202BE	FORT BRAGG	CA
K204AA	REDDING	CA
K206AC	SAN DIEGO	CA
K206AE	CRESCENT CITY	CA
K206AK	CAMARILLO, ETC.	CA
K206AN	CALLAHAN	CA
K206AS	SANTA PAULA	CA
K206AT	OJAI	CA
K207AV	PALM SPRINGS, ETC.	CA
K208AH	WEED, ETC.	CA
K214AA	REDDING	CA
K214AT	HORNBROOK	CA
K216AQ	FORT JONES & ETNA	CA
K216BD	FORT JONES, ETC.	CA
K217AS	BIG BEND & BUSH BAR	CA
K218AL	YREKA, ETC.	CA
K219AB	CRESCENT CITY, ETC.	CA
K219BD	BIG SUR VALLEY	CA
K220BZ	HAPPY CAMP	CA
K201AV	RIFLECO	
K202AT	ASPEN	CO
K203AJ	RIFLE, ETC.	CO
K203AT	WESTCLIFFE, ETC.	CO
K204AR	GYPSUM	CO
K205BA	RIDGWAY, ETC.	CO
K205BE	ESTES PARK	CO
K206AG	MONTROSE	CO
K208BG	DURANGO	CO
• K209AR	PALO, CANYON, CA	CO
K210AH	EAGLE	CO
K210AJ	DELTA	CO
K211AW	MANITOU SPRINGS	CO
K211AZ	ASPEN	CO
K214AK	STEAMBOAT SPRINGS	CO
K214AW	WALDEN	CO
K214AX	YUMA	CO
K215AC	ASPEN	CO
K215AN	STERLING	CO
K215BE	ESTES PARK	CO
K252BY	LAMAR	CO
W211AC	COCOA BEACH, ETC.	FL
K204BB	HALEIWA, ETC.	HI
K252BC	DUBUQUE	IA
K274AA	ELDRIDGE	IA
K209AQ	CHALLIS, ETC.	ID
• K219CZ	MCCALL	ID
K220BW	KELLOGG, ETC.	ID
K220BX	COEUR D' ALENE	ID
K220CG	SALMON	ID
K228CZ	NEW MEADOW/LAKEFORK	ID
K292EK	STANLEY/BONANZA	ID
K201BC	IOLA, ETC.	KS
K207AQ	PITTSBURG	KS
• K208AV	PARSONS	KS
• K213AN	JUNCTION CITY	KS
K213AO	MANHATTAN	KS
• K213AP	EMPORIA	KS
K213AQ	INDEPENDENCE	KS
K214AU	SHARON SPRINGS	KS
K216AZ	ATWOOD	KS
K217BG	MCDONALD	KS
K217BH	HERNDON	KS
K218AT	HERNDON	KS
K219AJ	GOODLAND	KS
K237CN	ATWOOD	KS
K252AV	ELKHART	KS
K252AW	TRIBUNE	KS
K252AX	ASHLAND	KS
K252AY	NESS CITY	KS
K252AZ	LIBERAL	KS
K252BJ	HAYS	KS
K252BL	COLBY	KS
K257BH	DODGE CITY	KS
K257DI	ST. FRANCIS	KS
K213AZ	LAKE CHARLES	LA
W224AO	HOUGHTON MI	
W265AI	IRONWOOD, ETC.	MI
• W272AG	MARQUETTE	MI

FM Radio Translators (continued)

K211AS	VIRGINIA	MN
K217AR	BLUE EARTH	MN
K220AQ	FAIRMONT	MN
K220AR	ALBERT LEA	MN
K228AO	ALBERT LEA	MN
K232AQ	AUSTIN	MN
K249BK	INTERNATIONAL FALLS	MN
K257AH	MORRIS	MN
K269BK	LA CRESCENT(LA CROSSE, WI)	MN
K292CT	WINONA	MN
W269AC	ELY	MN
K202AN	JOPLIN	MO
K210AU	KIRKSVILLE	MO
K203AI	COLUMBUS MT	
K207AL	BOZEMAN, ETC.	MT
K214AM	MILES CITY	MT
K219AT	HELENA	MT
K288DZ	DILLON	MT
W209AE	CULLOWHEE, ETC.	NC
W218AB	SYLVA, ETC.	NC
W218AD	BREVARD	NC
K208BF	CRARY, ETC.	ND
K218AV	DEVILS LAKE, ETC.	ND
K219AX	LAKOTA	ND
• W201AC	NASHUA	NH
W212AF	NASHUA	NH
K204AK	HOSPAH-WHITEHORSENM	
K208AL	NAGEEZI-BLANCO, ETC.	NM
K208AS	ALAMOGORDO	NM
K212AE	NASCHITI, ETC.	NM
K212AN	ESPANOLA	NM
K214AI	COUNSELOR, ETC.	NM
K214AO	ESPANOLA	NM
K215AS	ADOBE COMMUNITY, ETC.	NM
K216AH	THOREAU, ETC.	NM
K216AL	ARROYO SECO	NM
K216BJ	ROSWELL	NM
• K217AH	ALAMO NAVAJO INDIAN RESERVATN	NM
K217AP	SILVER CITY	NM
K217BC	TUCUMCARI	NM
K217BD	RUIDOSO	NM
K217BI	FARMINGTON, ETC.	NM
K219AI	STAR LAKE TRADING POST	NM
K220AK	CROWNPOINT-TOHATSCHI	NM
K220AN	TRUTH OR CONSEQUENCES	NM
K220AO	LORDSBURG	NM
K220AV	TAOS	NM
K220AW	LAS VEGAS	NM
K220AX	SHIP ROCK, ETC.	NM
K265BW	PINE HILL	NM
• K267CI	FARMINGTON	NM
• K269CO	GALLUP	NM
• K272BU	GRANTS	NM
K201AL	SEARCHLIGHT	NV
K201BF	SCOTTY'S JUNCTION	NV
K203AX	SEARCHLIGHT	NV
K204AN	PAHRUMP	NV
K204AO	MOAPA, ETC.	NV
K204AP	INDIAN SPRINGS	NV
K204AQ	BOULDER CITY, ETC.	NV
K204AT	MESQUITE	NV
K204AZ	SCOTTY'S JUNCTION, ETC.	NV
K208BB	LAUGHLIN, ETC.	NV
K217AX	WINNEMUCCA	NV
K217BA	INCLINE VILLAGE, ETC.	NV
K218AW	LOVELOCK, ETC.	NV
K219AV	BEATTY	NV
W209AF	CORTLAND NY	
W211AE	MAYVILLE, ETC.	NY
W214AA	CORNING	NY
W215AB	WATKINS GLEN	NY
• W216AB	ELMIRA	NY
W219AG	ONEONTA	NY
W220AF	UTICA	NY
W204AB	NEW PHILADELPHIA OH	
W204AJ	WOOSTER	OH
K218AM	BARTLESVILLE OK	
K257BG	GUYMON	OK
K201AK	JACKSONVILLE, ETC.	OR
K203AC	COQUILLE	OR
K204AG	CAMAS VALLEY	OR
K204AV	LINCOLN, ETC.	OR
K205BD	GRANTS PASS, ETC.	OR
K205BF	NEWPORT, ETC.	OR
K205BJ	BEND	OR
K206AI	COOS BAY, ETC.	OR
K207AB	SUTHERLIN & GLIDE	OR
K207AM	VALLEY FALLS, ETC.	OR
K208AX	LAKEVIEW	OR
K210AV	LA GRANDE	OR
K211BF	BURNS, ETC.	OR
K212AQ	RILEY, ETC.	OR
K213AC	ROSEBURG	OR
K213AI	KLAMATH FALLS	OR
K214AQ	JOHN DAY, ETC.	OR
K215AR	CAVE JUNCTION, ETC.	OR
K215AU	RILEY, ETC.	OR
K216AK	BROOKINGS	OR
K216BI	VALLEY FALLS, ETC.	OR
K217AF	LANGLOIS	OR
K218AE	COTTAGE GROVE	OR
K218AG	OAKRIDGE	OR
K218AH	GOLD BEACH	OR
K218AQ	BURNS, ETC.	OR
K218AZ	THE DALLES	OR
K219AM	BANDON, ETC.	OR
K219AP	CHILOQUIN	OR
K219BB	ROSEBURG	OR
K220AC	RIDDLE, ETC.	OR
K220AJ	GOLD BEACH	OR
K220BJ	KLAMATH FALLS, ETC.	OR
K220CF	JACKSONVILLE, ETC.	OR
K224AQ	FLORENCE	OR
W207AF	MEADVILLEPA	
W211AF	WARREN	PA
W212AE	MANSFIELD	PA
W257AI	ALLENTOWN	PA
W261BZ	WILLIAMSPORT	PA
W261CA	LEWISBURG	PA
K201AP	BELLE FOURCHE	SD
K201AQ	HOT SPRINGS	SD
K202AU	RAPID CITY	SD
K203AR	DUPREE, ETC.	SD
K213AV	GREEN GRASS, ETC.	SD
K216AO	SPEARFISH	SD
K216AP	EDGEMONT	SD
K216AY	CHERRY CREEK	SD
• K219BF	ROSEBUD	SD
K220AZ	PRINGLE	SD
K220BA	LEAD	SD

FM Radio Translators (concluded)

K220BN	BRIDGER, ETC.	SD
K220BQ	WHITE HORSE, ETC.	SD
K201AA	DELTA, ETC.	UT
K201AE	COALVILLE, ETC.	UT
K202AF	RANDOLPH, ETC.	UT
K202AW	CEDAR CITY	UT
K203AB	RURAL SUMMIT COUNTY	UT
K203AV	BRIGHAM CITY	UT
K206AM	WASHINGTON	UT
K208AG	PARK CITY	UT
K208AJ	DELTA, ETC.	UT
K208AQ	PRICE, ETC.	UT
K209AJ	VERNAL, ETC.	UT
K211BB	KANAB	UT
K213AA	LAKETOWN & GARDEN CITY	UT
K213AM	ST. GEORGE	UT
K216AC	TROPIC, ETC.	UT
• K216AD	RANDOLPH, ETC.	UT
K216AM	ANETH, ETC.	UT
K218AA	MOAB, ETC.	UT
K218AB	VERNAL, ETC.	UT
K218AJ	MONROE, ETC.	UT
K220AY	HEBER CITY, ETC.	UT
K285BK	TABIONA, ETC.	UT
K292DA	TABIONA, ETC.	UT
W209AA	CHARLOTTESVILLE	VA
W209AG	ROANOKE, ETC.	VA
• W211AA	ROANOKE, ETC.	VA
K204BF	LONGVIEW, ETC.	WA
K204BH	WOODLAND, ETC.	WA
K205AH	OMAK, ETC.	WA
K208AW	LONGVIEW, ETC.	WA
K210AC	MOSES LAKE	WA
K210AE	PULLMAN	WA
K211AJ	WENATCHEE, ETC.	WA
K211AO	ABERDEEN, ETC.	WA
K211AP	CENTRALIA, ETC.	WA
K212AB	CLARKSTON(LEWISTON,ID)	WA
K212AC	YAKIMA, ETC.	WA
K212AD	ELLENSBURG, KITTITAS	WA
K212AF	GOLDENDALE	WA
K212AG	RAYMOND, ETC.	WA
K213BA	BELLINGHAM	WA
K217AY	MOUNT VERNON, ETC.	WA
K218AP	PORT ANGELES, ETC.	WA
K218AR	ASHLAND	WI
W208AC	WAUSAU, ETC.	WI
K203AU	LANDER	WY
K204AD	CASPER, ETC.	WY
K204BE	GILLETTE	WY
K206AJ	SINCLAIR	WY
K210AF	TORRINGTON	WY
K215AY	RIVERTON	WY
K216BH	GREYBULL	WY
K285CY	JACKSON	WY

DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA